IMPROVEMENT SCIENCE CURRICULUM (ISC)

Week Four

BRIEF SURVEY

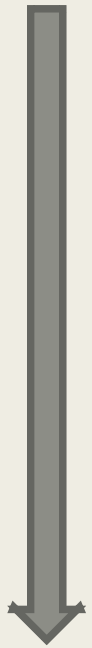
goo.gl/EkGrXR

(case sensitive)

Curriculum Overview

- Week 1: Background: Theory, Methods
- Week 2: Tools for Improvement
- Week 3: Data Science
- Week 4: RCA & System Errors
- Week 5: Diagnostic Errors & Error Impact
- Week 6: Project Presentation

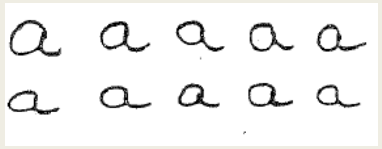
Personal Improvement Project

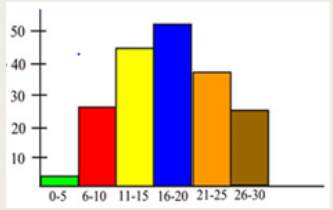


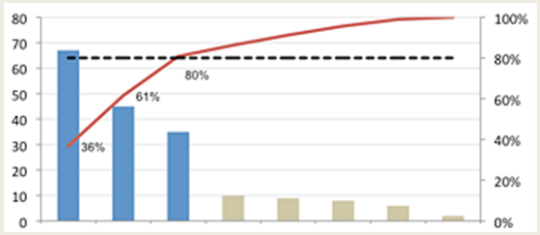
Today's Agenda

- 0900-0910: Brief survey & review
- 0910-0925: PIP Check-in
- 0925-0945: Types of errors
- 0945-1010: Culture of error reporting
- 1010-1015: Break
- 1020-1130: RCA

Week 3 Recap







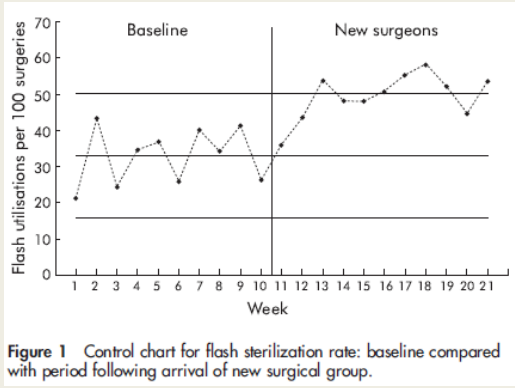


Figure 1 Control chart for flash sterilization rate: baseline compared with period following arrival of new surgical group.

Enumerative

Analytic

PIP

1. Module/Week 1:
   - *Problem Statement*
   - *Aim Statement*
2. Module/Week 2:
   - *Process Map & Fishbone*
   - *Collect Baseline Data*
   - *Identify at least one process/outcome/balancing measure*
3. Module/Week 3: PDSA Cycle #1
4. Module/Week 4: PDSA Cycle #2
5. Module/Week 5: PDSA Cycle #3
6. Module/Week 6: PRESENTATION

PIP Check In

- Complete 3rd column of PIP Worksheet
- Pair with a (new!) partner and share PDSA cycle #1
- Discuss lessons learned from cycle #1
- Based on results, what will you keep the same and what will you change?

PIP Assignment

- PDSA Cycle #2: Clearly delineate:
  - *Change concept you used*
  - *Plan*
  - *Do*
  - *Study*
  - *Act*
- Please use graphic representations including pareto, run charts, histograms, etc to display your data for your presentation.

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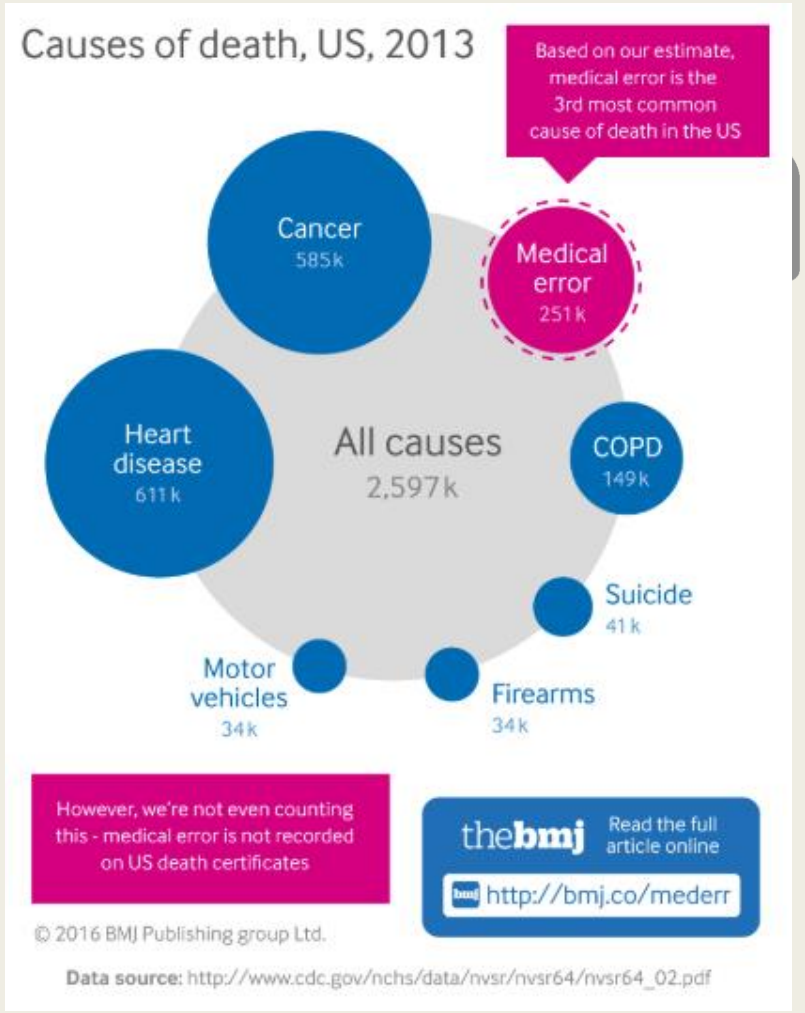
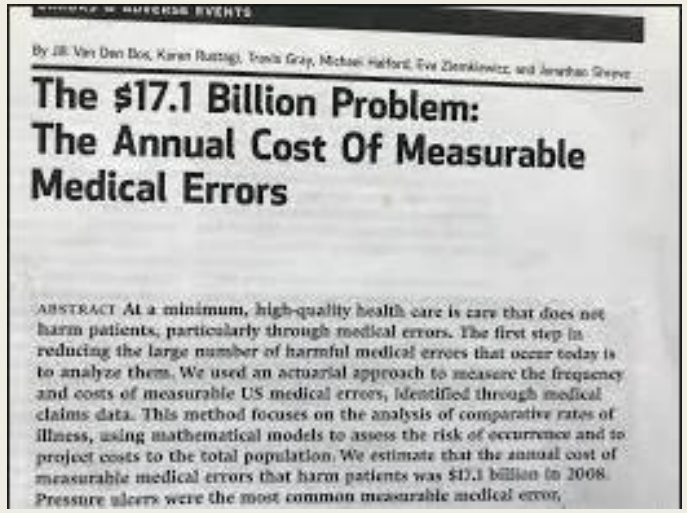
A Comedian on Errors

https://www.youtube.com/watch?v=zDKdvTecYAM

Why is this important?





By Jill Van Den Bos, Karen Rustagi, Travis Gray, Michael Halford, Eva Zlotnikowicz, and Jonathan Sheyer

The $17.1 Billion Problem: The Annual Cost Of Measurable Medical Errors

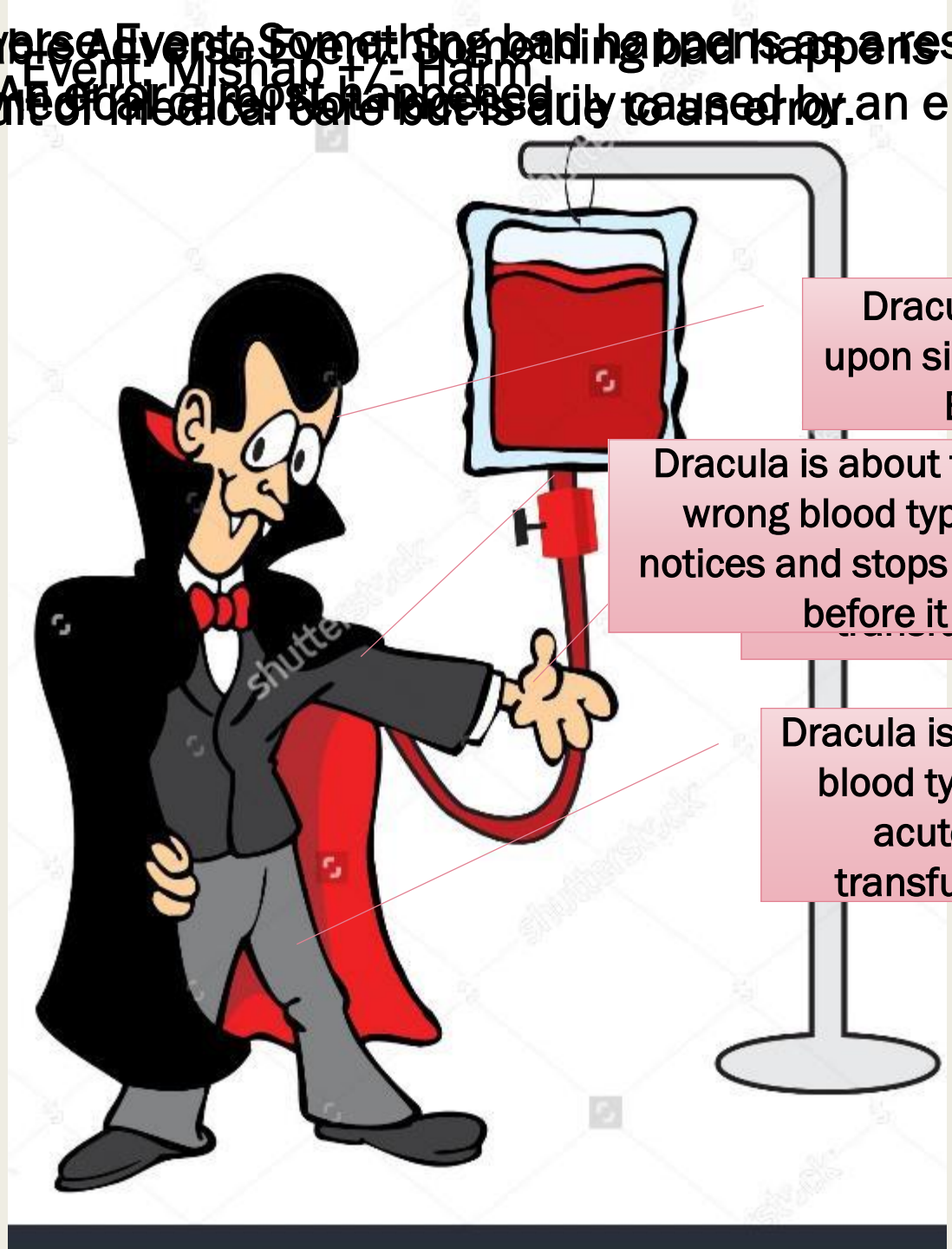
ABSTRACT At a minimum, high-quality health care is care that does not harm patients, particularly through medical errors. The first step in reducing the large number of harmful medical errors that occur today is to analyze them. We used an actuarial approach to measure the frequency and costs of measurable US medical errors, identified through medical claims data. This method focuses on the analysis of comparative rates of illness, using mathematical models to assess the risk of occurrence and to project costs to the total population. We estimate that the annual cost of measurable medical errors that harm patients was $17.1 billion in 2008. Pressure ulcers were the most common measurable medical error,

Preventable Adverse Event: Something bad happens as a result of medical care but is due to an error.

Near Miss: An error almost happened

Adverse Event: Something bad happens as a result of medical care but is due to an error.

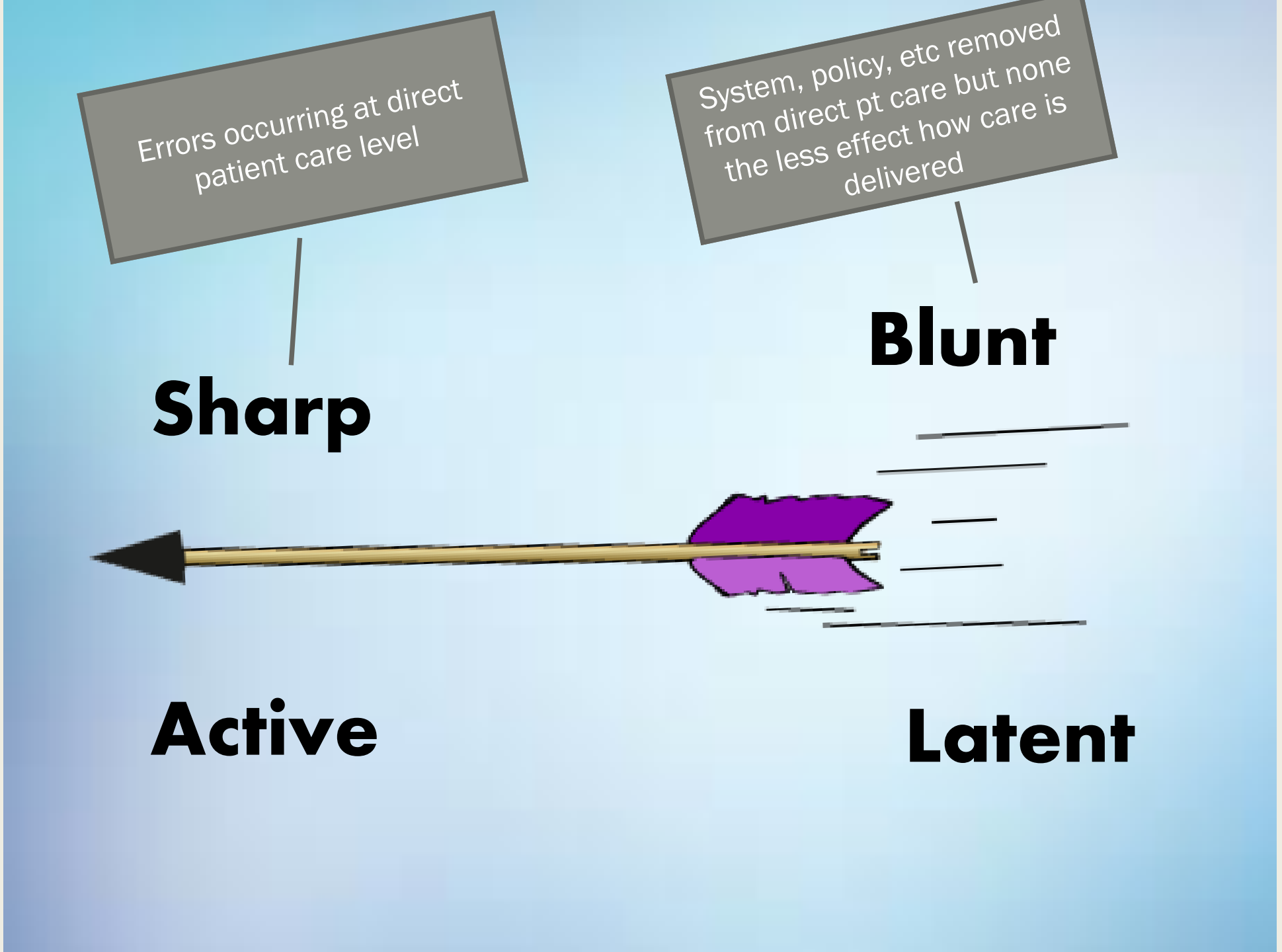
Event: Mishap +/- Harm



Dracula passes out upon sight of the blood. But is OK.

Dracula is about to be given the wrong blood type but the RN notices and stops the transfusion before it starts

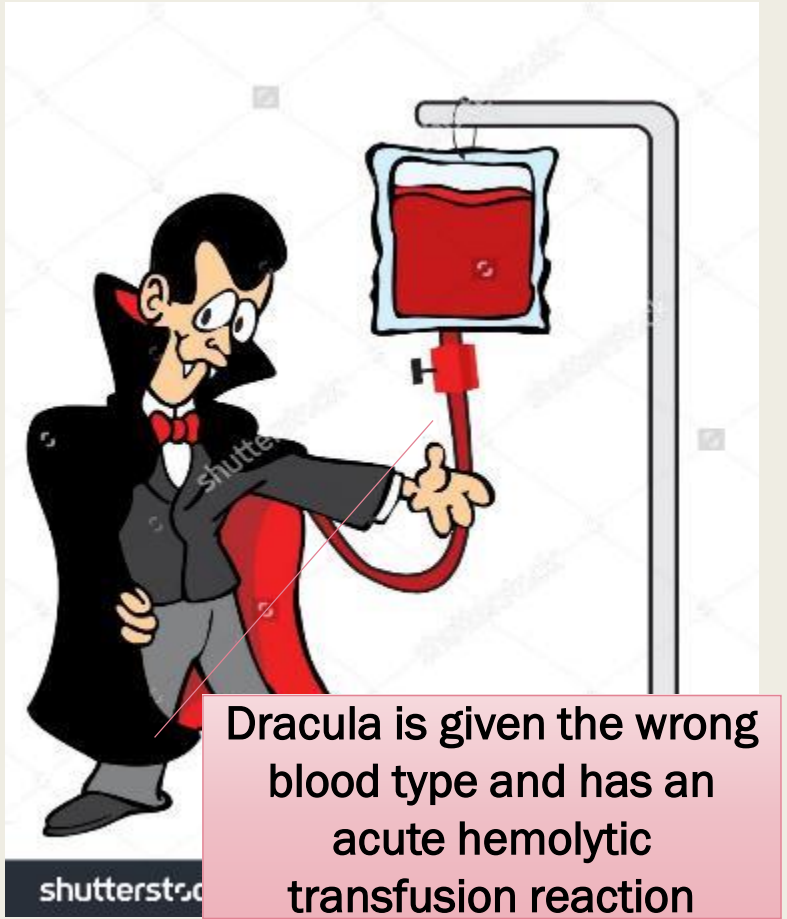
Dracula is given the wrong blood type and has an acute hemolytic transfusion reaction


Errors occurring at direct patient care level
System, policy, etc removed from direct pt care but none the less effect how care is delivered
Sharp
Blunt
Active
Latent

BLUNT:

-Blood bank staff have no standardized work for blood transfusion orders.
- Pathology director recently quit and blood transfusion department is in chaos
-Transport is allowed to carry blood for multiple patients at once
-New RN who didn't understand blood transfusion protocol
-RN didn't check T&S and what was written on blood bag
- RN had 2 patients getting transfusion and confused them.

ACTIVE:



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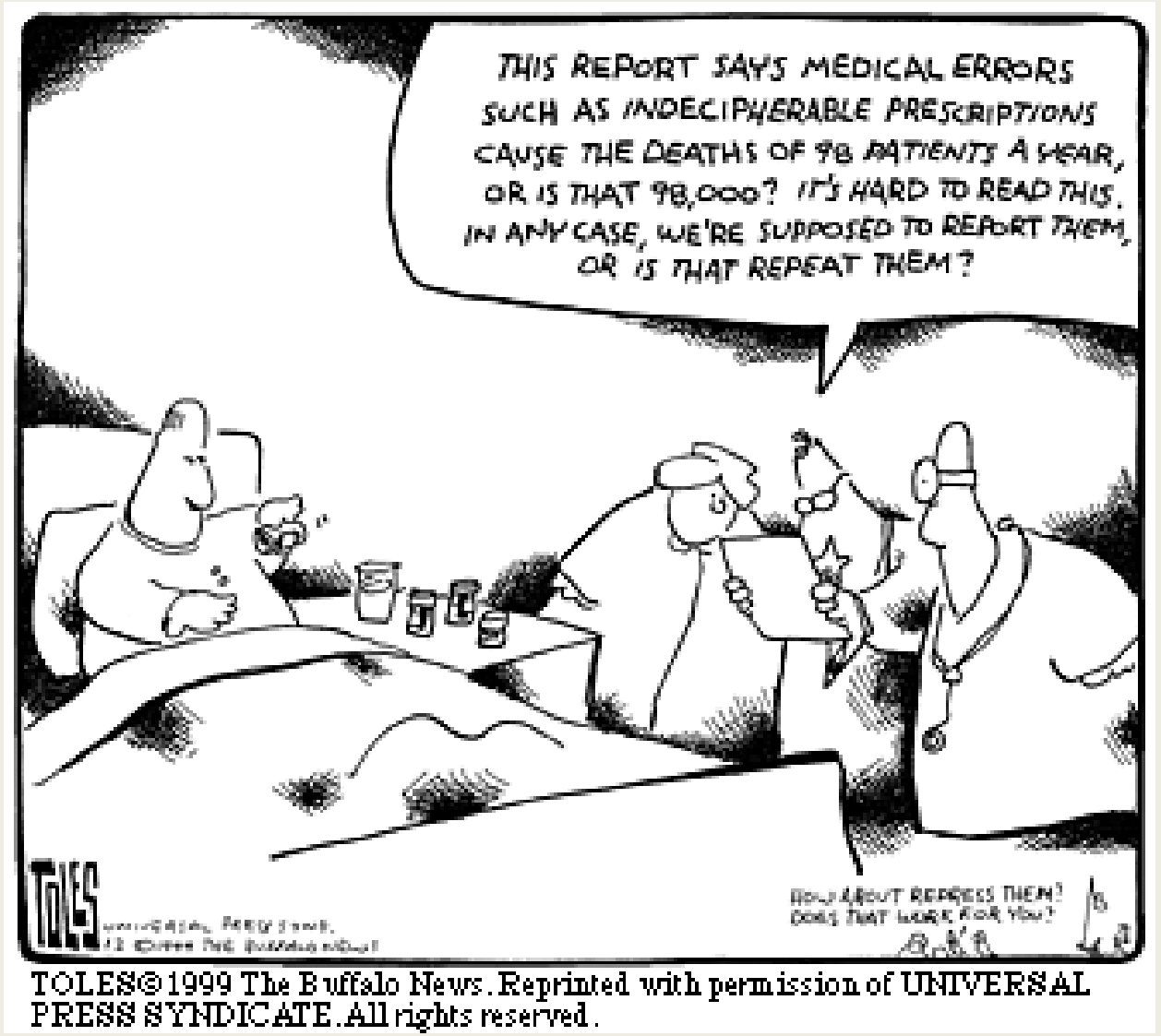
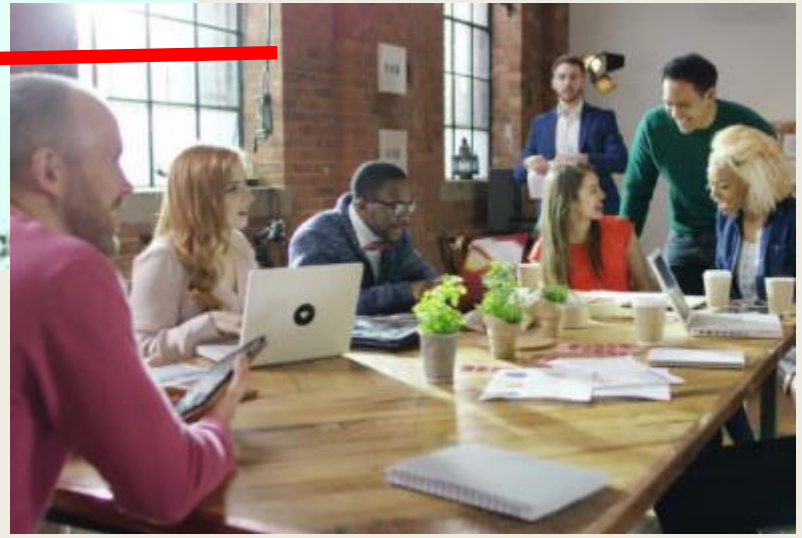
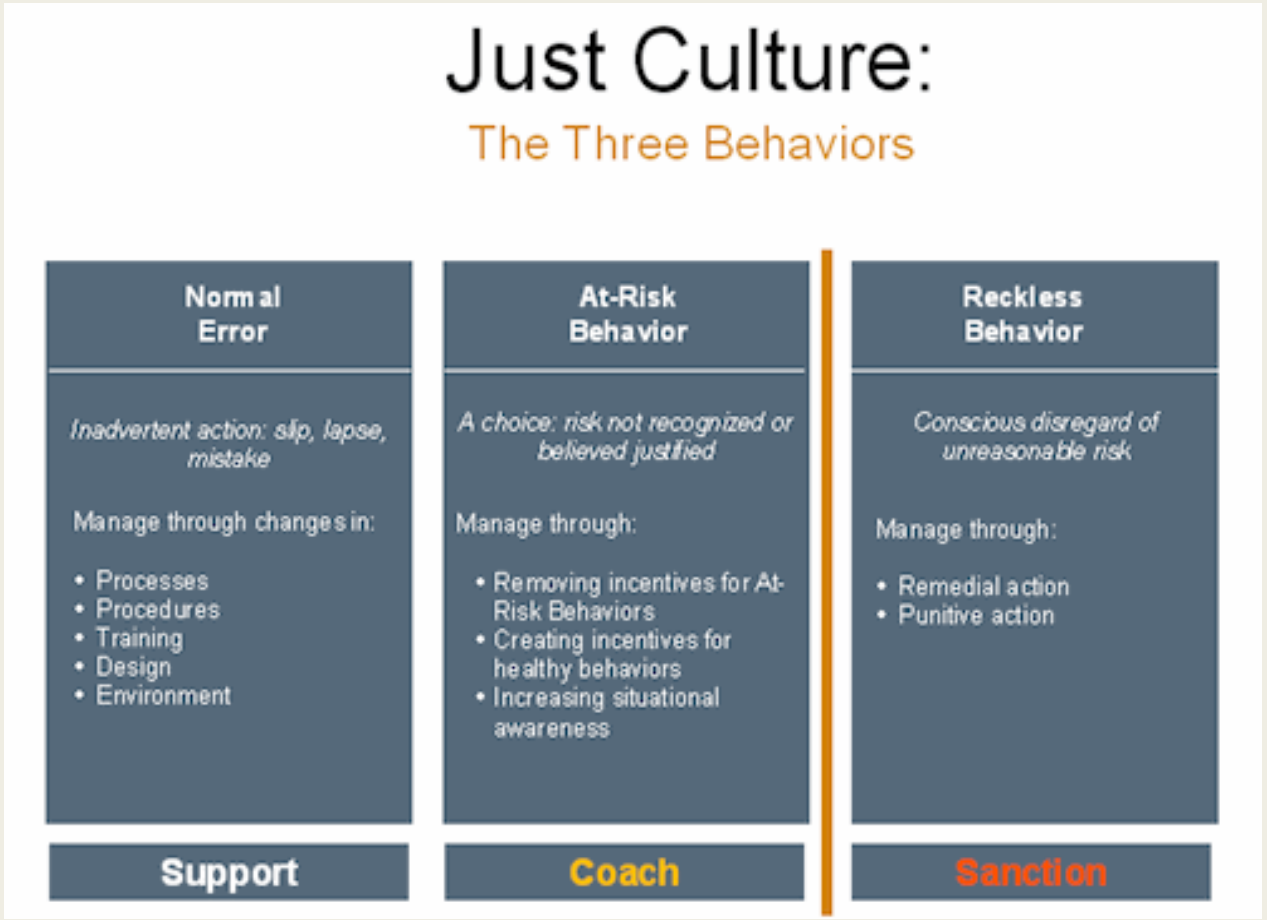


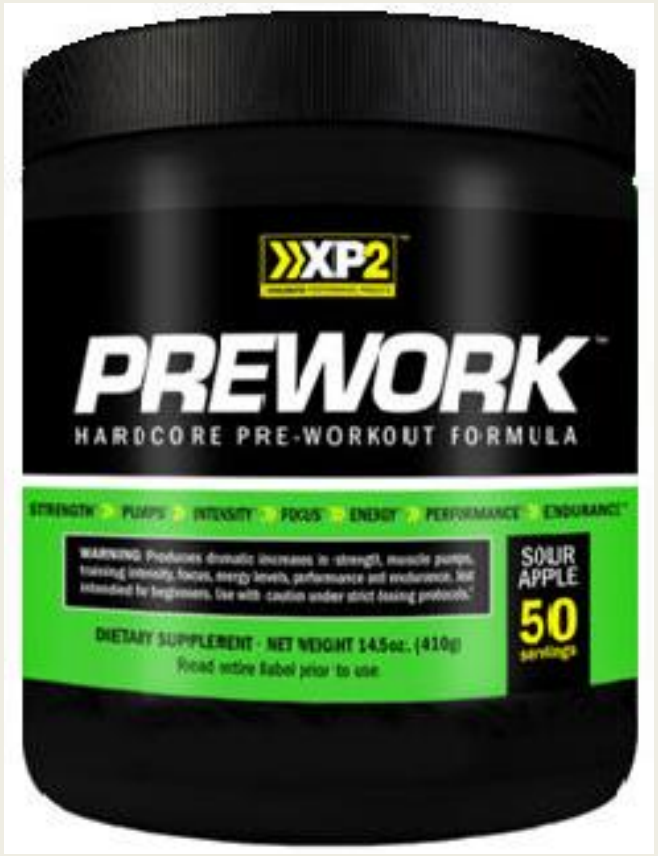
Culture of Safety

- What is Culture?
  - *“The way we do things around here”*
- What is a Culture of Safety?
  - *Acknowledgement of the high-risk nature of what we do and a determination to work together to achieve consistent, safe operations*
  - *A non-punitive environment*
  - *Shared responsibility to identify and report errors*
  - *Encouragement of collaboration across ranks to seek solutions*
  - *An organizational commitment to address safety concerns*


Safety Culture
Just culture
Reporting culture
Learning culture




Just Culture:
The Three Behaviors
Normal Error
Inadvertent action: slip, lapse, mistake
Manage through changes in:
• Processes
• Procedures
• Training
• Design
• Environment
At-Risk Behavior
A choice: risk not recognized or believed justified
Manage through:
• Removing incentives for At-Risk Behaviors
• Creating incentives for healthy behaviors
• Increasing situational awareness
Reckless Behavior
Conscious disregard of unreasonable risk
Manage through:
• Remedial action
• Punitive action
Support
Coach
Sanction


XP2
PREWORK
HARDCORE PRE-WORKOUT FORMULA
SOUR APPLE
50
servings

How to report an error?

www.IMRESPDX.com

or

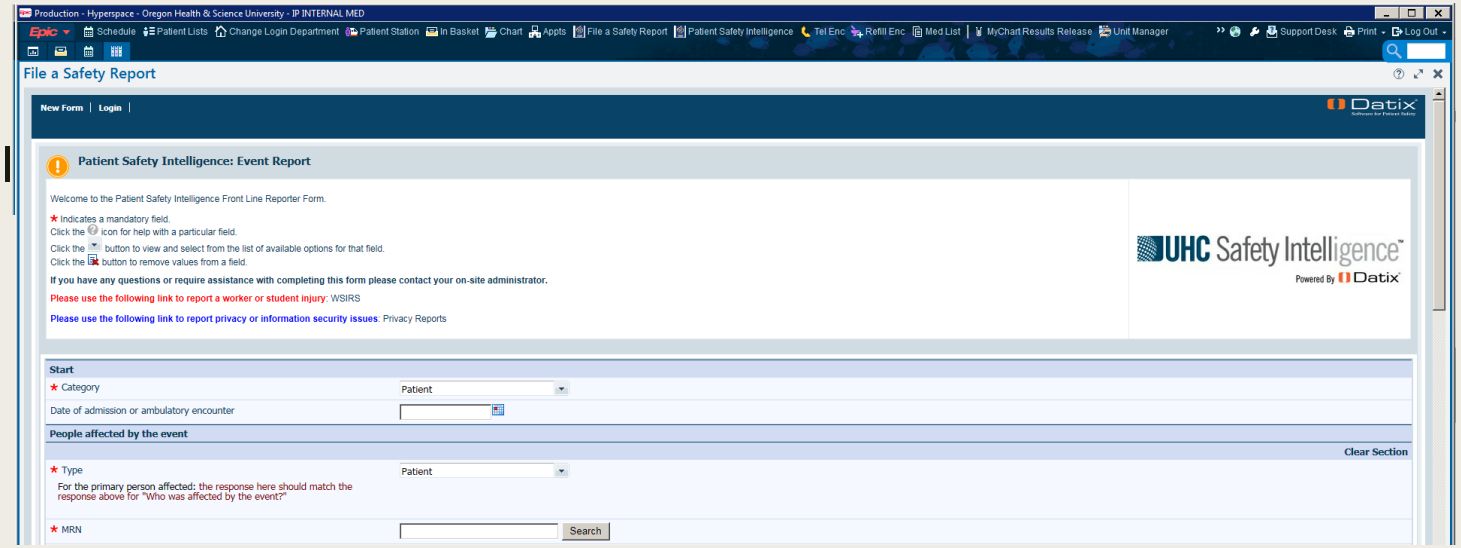
Through Epic

or

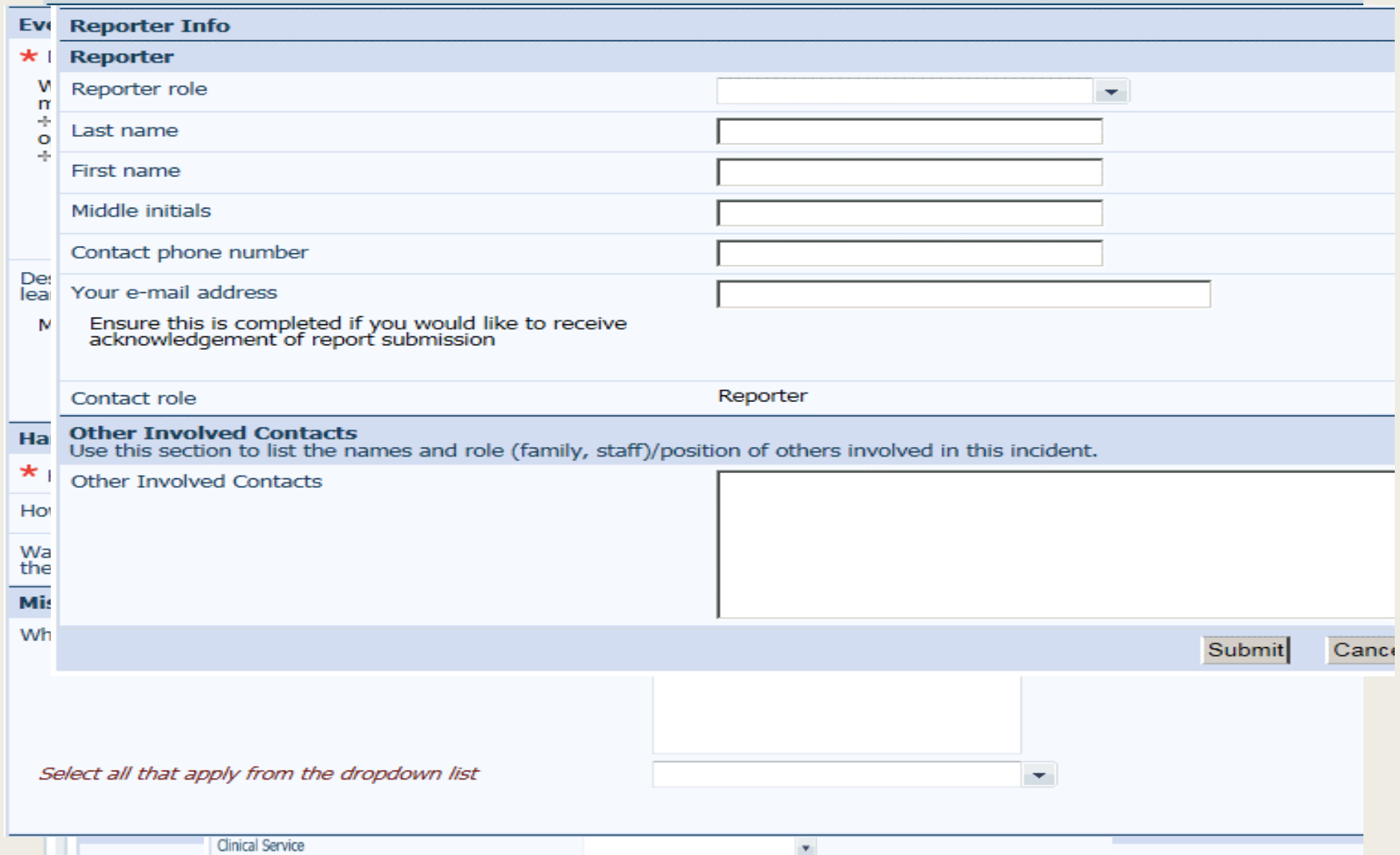
VA Home Page

Patient Safety Report @ OHSU

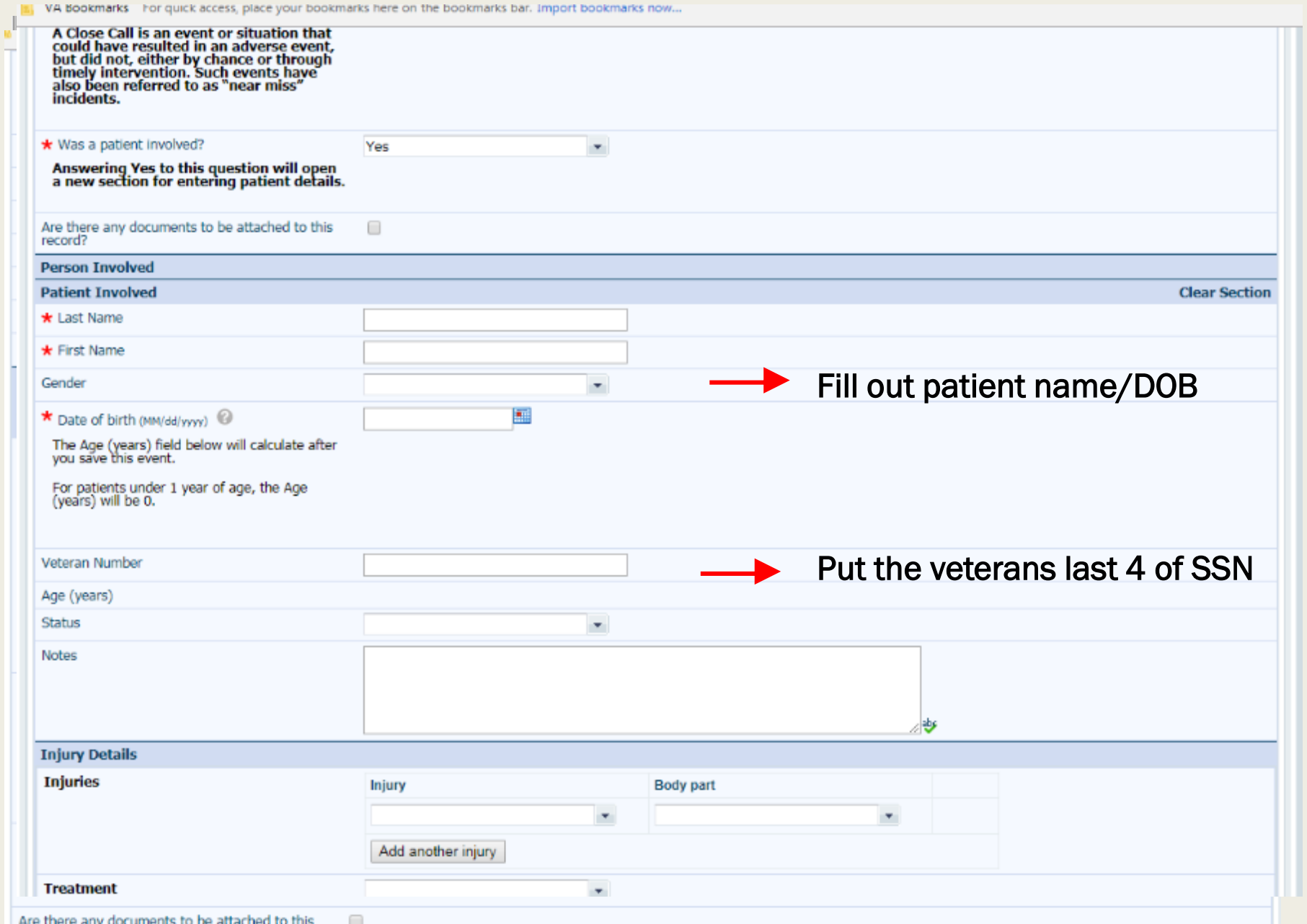
- New & I



Patient Safety Report @ OHSU



Patient Safety Report @ The VA



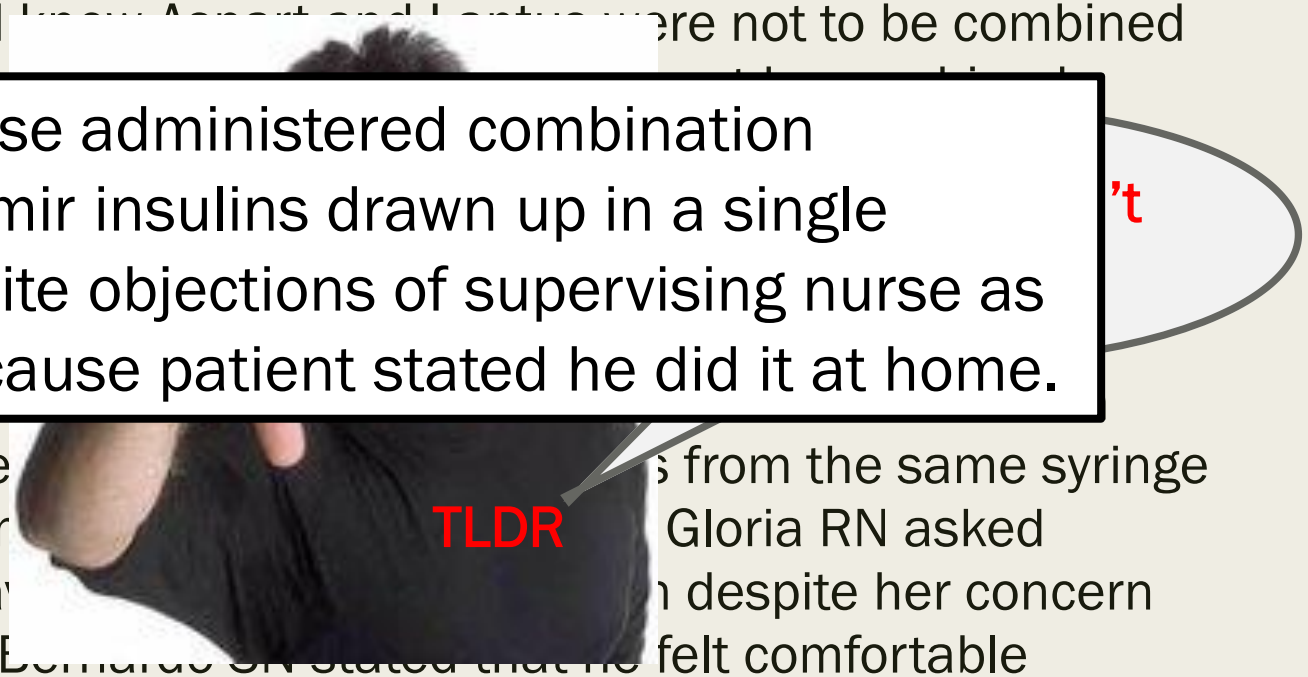
Fill out patient name/DOB

Put the veterans last 4 of SSN

Entering names and dates is easy…what do I write next?

The Description

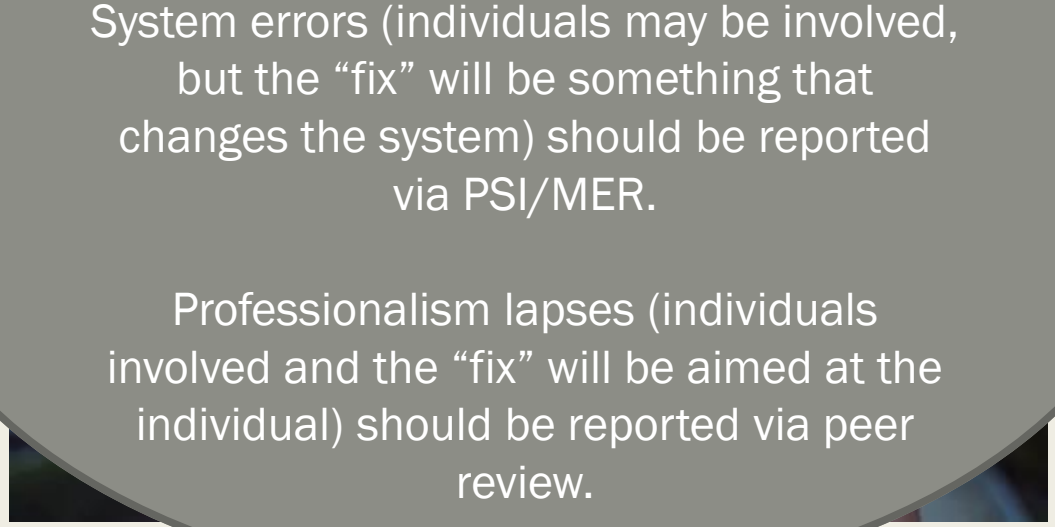
Bernardo a student nurse (SN) drew Aspart and Detemir into the same syringe d/t patient telling him that this is what he does "all the time" at home. Gloria, RN in room as witness for Bernardo SN. Gloria RN stated to Bernado SN that she did not know if Aspart and Detemir were compatible. She stated that she did [illegible] were not to be combined - so the[illegible] either. [illegible] IV/SQ/[illegible] Bernar[illegible] giving t[illegible] safe. B[illegible] proceeded to administe[illegible]s from the same syringe into the patients abdom[illegible] Gloria RN asked Bernardo SN why he ga[illegible]n despite her concern for the patients safety. [illegible] felt comfortable combining the two medications since the patient said he did it at home. Charge RN notified of incident. Pharmacy called for insight. Pharmacist Vlademir stated that they do not recommend combining Aspart and Detemir.



The Description

Today I had a very unf… Helga… barging into our … patient. Alarm… constipate… patient I … …wever, is that RN … …de, and pushy a… … eyes when I talk. She…

OMG. TMI.



Take home message:

System errors (individuals may be involved, but the "fix" will be something that changes the system) should be reported via PSI/MER.

Professionalism lapses (individuals involved and the "fix" will be aimed at the individual) should be reported via peer review.

The Description

- Upon transfer to the floor from ED pt not placed on droplet isolation des
  RN was notifi
  positive requ

abx for 7 hours
ue to lack of
PICC nurse to
/ placement.

- Foley d/c
  removed by RN 2/2 concern over incontinence. Not communicated to team. Went unnoticed and pt developed CAUTI 2 days later w/foley still in place.

What happens when you report

There is no standard to contact you to tell you what happened..

But you can check back into your reports and find out what happened. It just won't prompt you.

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BREAK

5 minutes

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Root Cause Analysis: Mystery Dinner Style

Created by: Matthew DiVeronica, Shona Hunsaker, Jacob Luty, Andrea Smeraglio, Christopher Terndrup & Garrett Waagmeester

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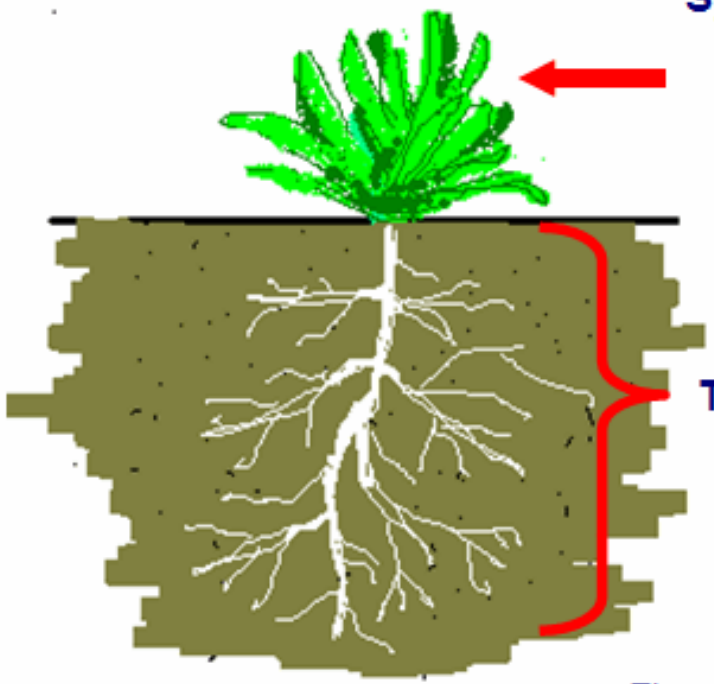
Root Cause Analysis Basics



Symptom of the problem.
"The Weed"
Above the surface
(obvious)

The Underlying Causes
"The Root"
Below the surface
(not obvious)

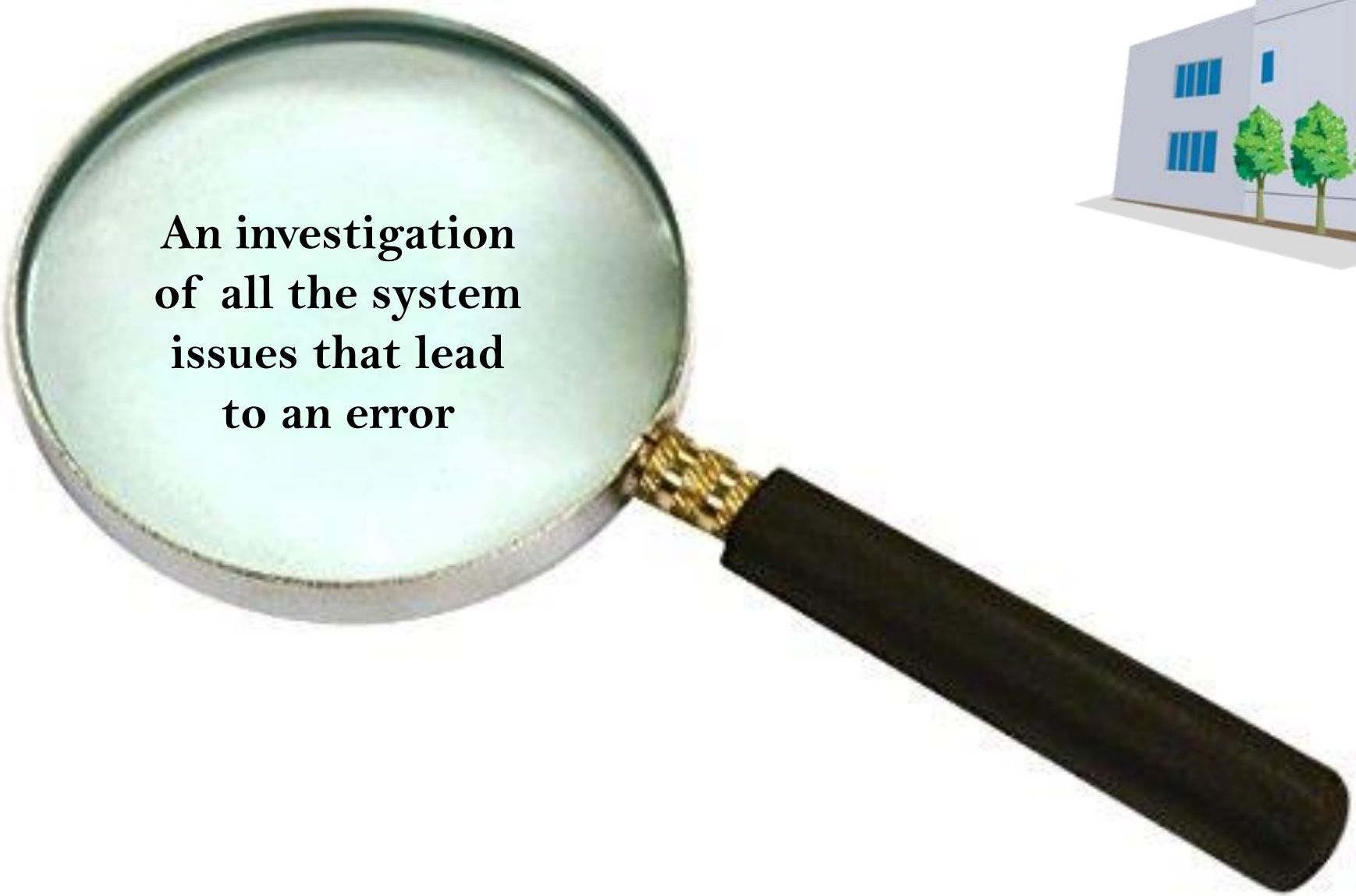
The word root, in root cause analysis, refers to the underlying causes, not the one cause.

= **These are the errors, events, near misses that take place in the hospital**

= **These are the underlying issues within a system that allow errors, events and near misses to occur and reoccur**

https://www.google.com/search?q=root+cause&source=lnms&tbm=isch&sa=X&ved=0ahUKEwjaga-q3cbZAhXGz1QKHb7mBSkQ_AUICigB&biw=1280&bih=590#imgrc=A_oc2ALQu5unaM:

What is an RCA?



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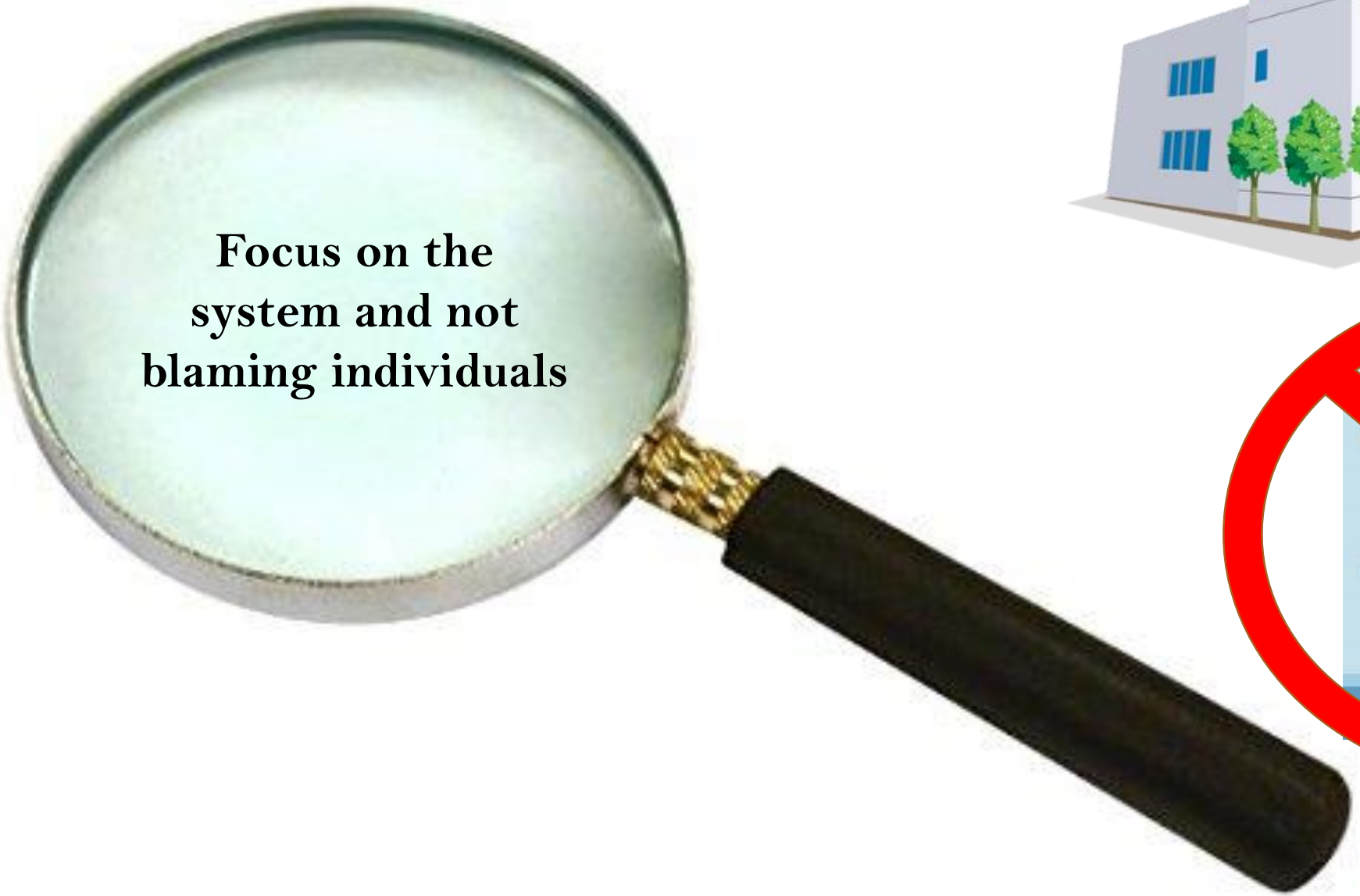

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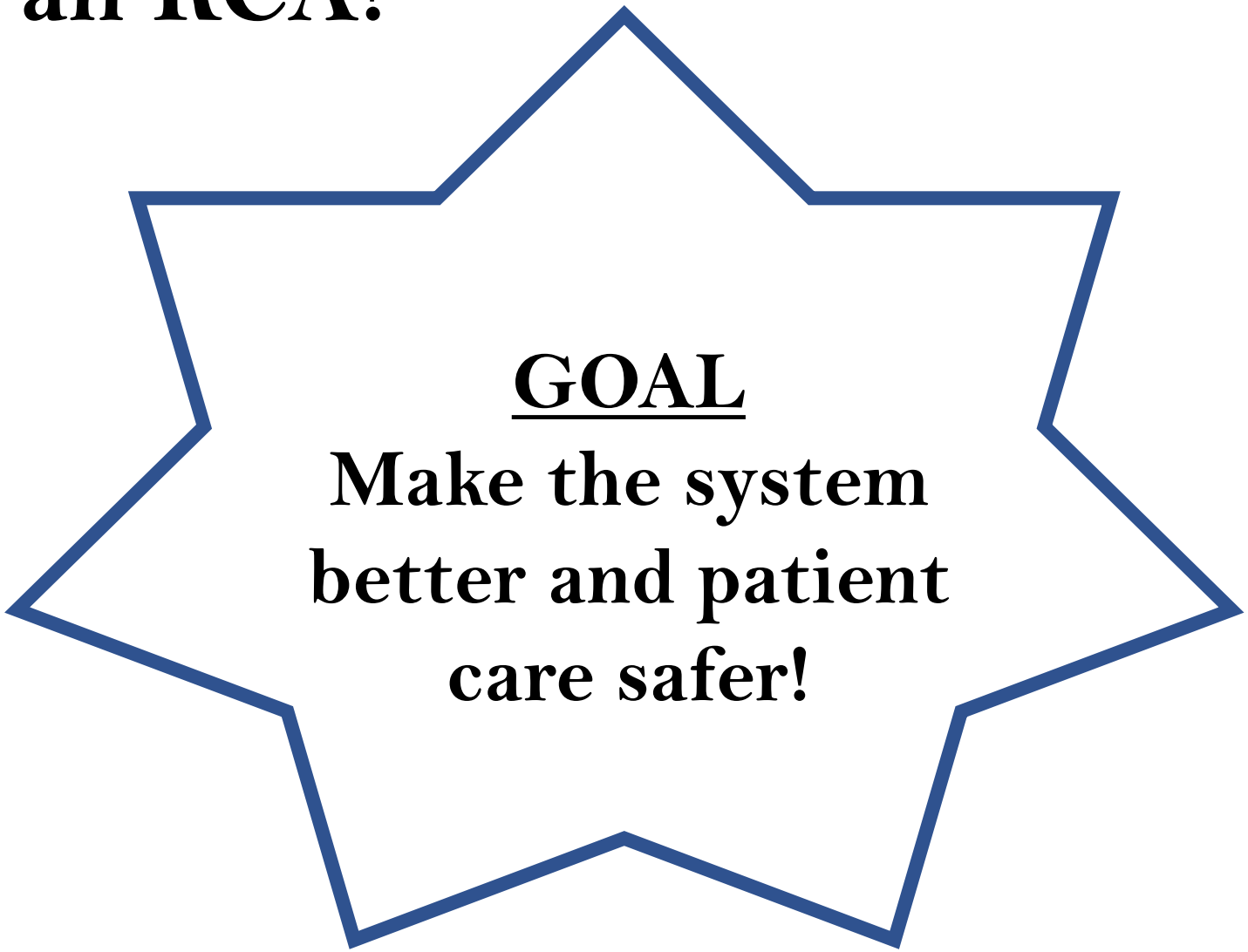
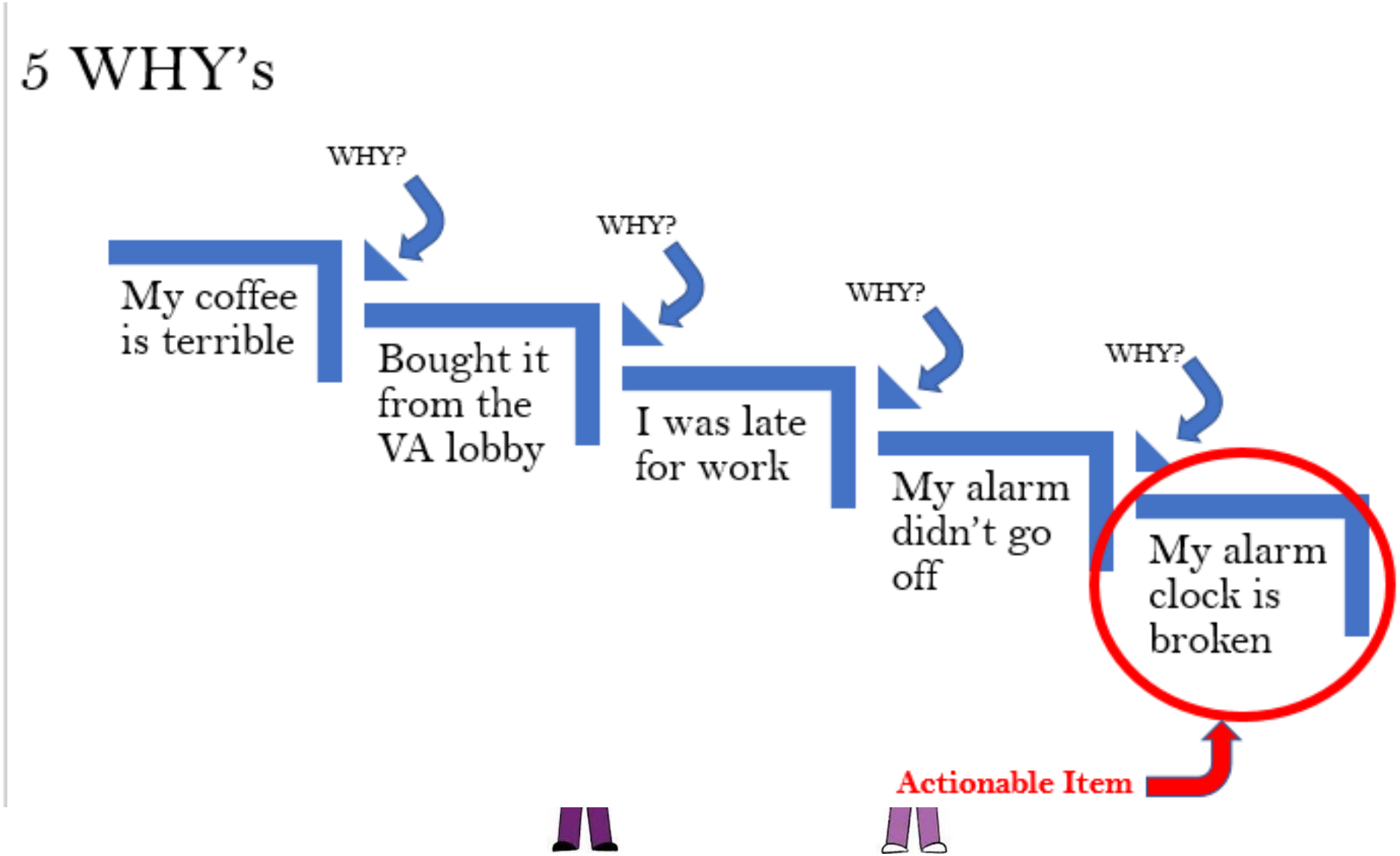
What is an RCA?



Root Cause Analysis (RCA)



https://www.google.com/search?q=average+4+year+old&source=lnms&tbm=isch&sa=X&ved=0ahUKEwjaw4r628bZAhVoyVQKHSrRCO0Q_AUICigB&biw=1280&bih=590#imgrc=iaX2KpaN4kcKRM:

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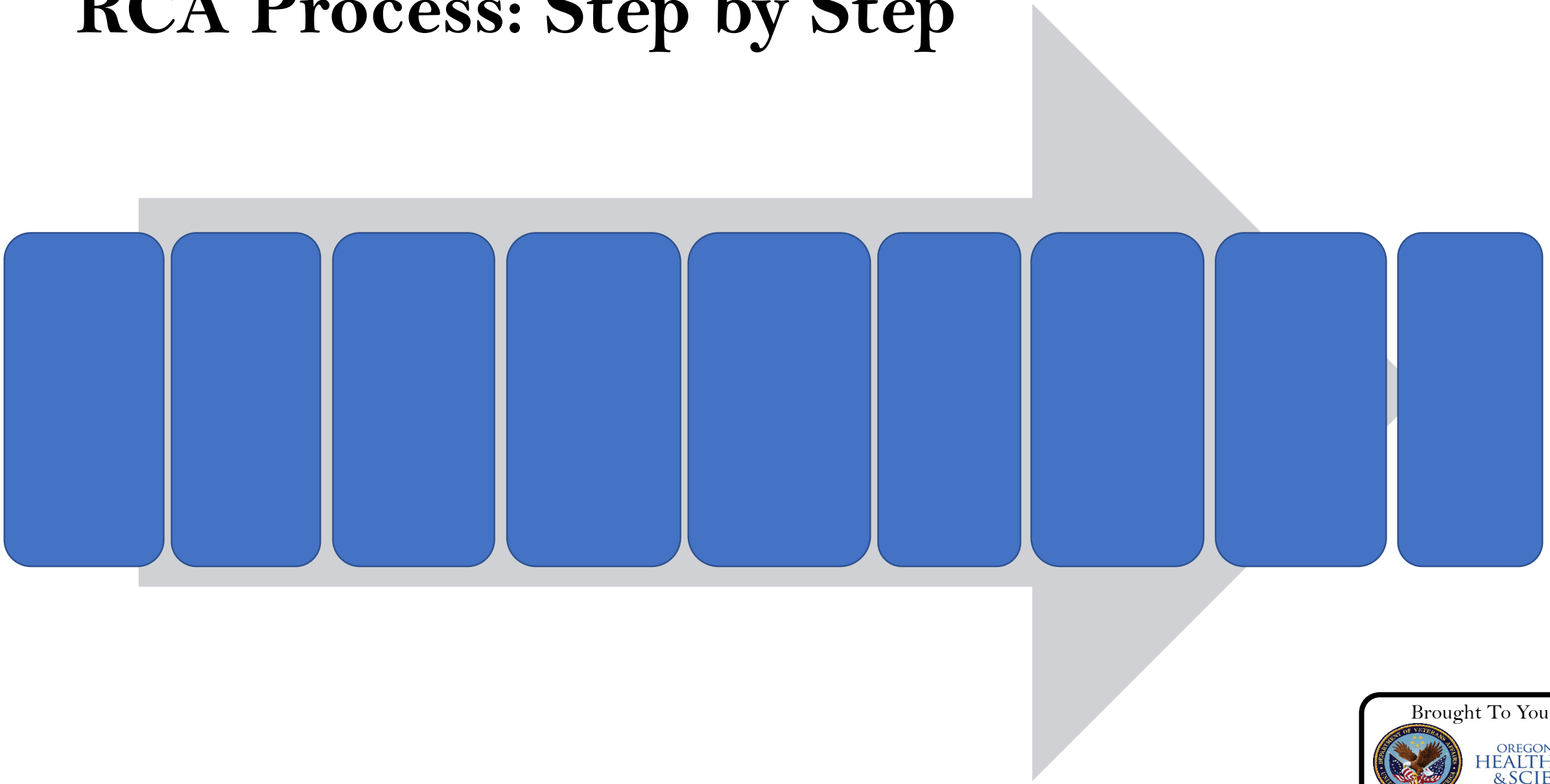
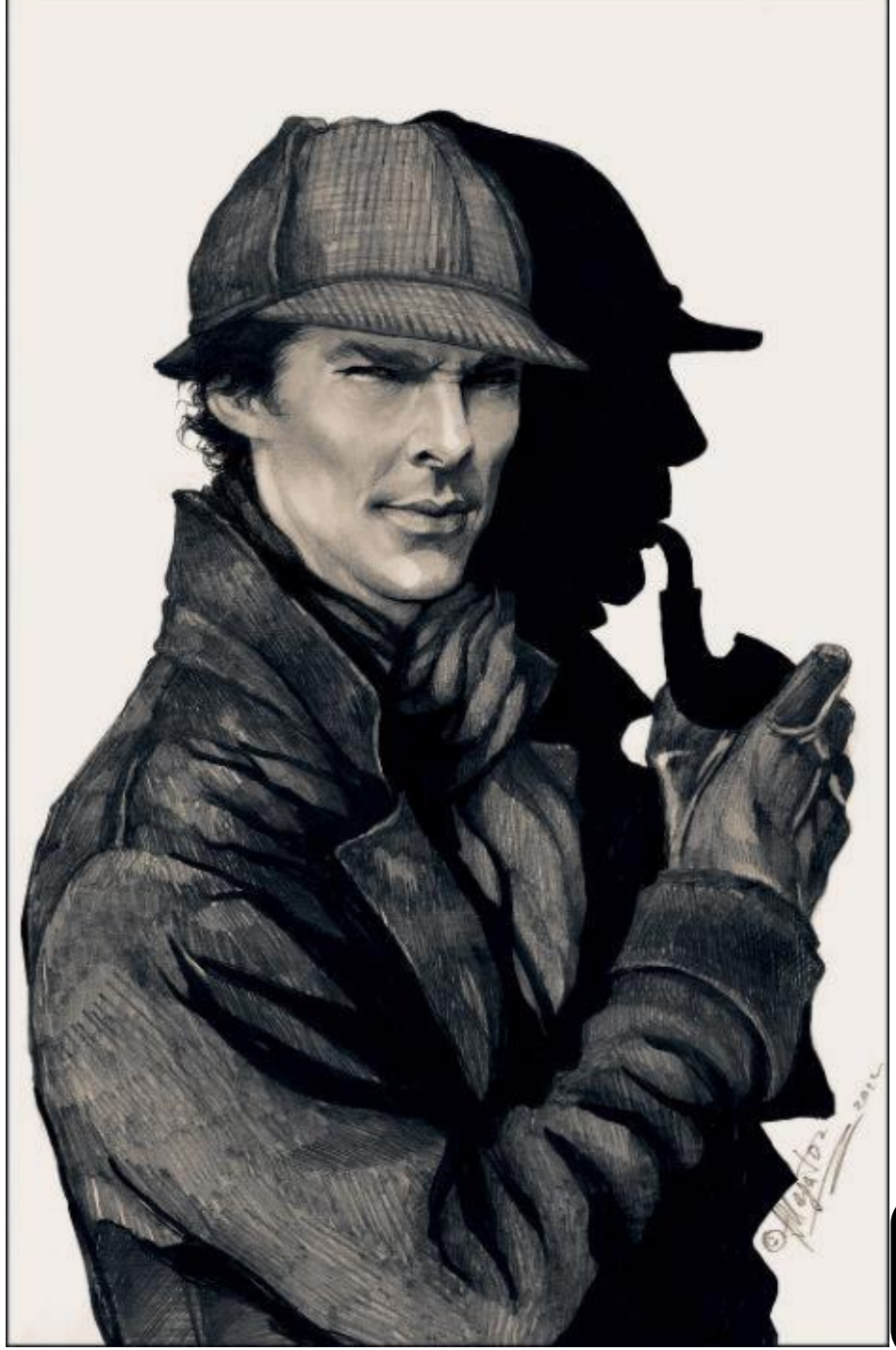
RCA Process: Step by Step



"When you have eliminated the impossible, whatever remains, however improbable, must be the truth."

Sherlock Holmes



https://www.google.com/search?q=sherlock+holmes&source=lnms&tbm=isch&sa=X&ved=0ahUKEwiuweSM3MbZAhVHwFQKHXf5DqIQ_AUICigB&biw=1280&bih=590#imgrc=Cxh3yrcxmN1SPM:

Root Cause Analysis: Mystery Dinner Style

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Case Intro

Meet Nick… our patient safety officer.

"Hi. I'm Nick, the Patient Safety Officer for this hospital. Every day I review our Medical Event Reports. Employees enter one of these when an event occurs that they felt placed a patient at risk of harm or did harm a patient.

I was just reviewing this report that was submitted yesterday afternoon. I need you to help me lead a Root Cause Analysis on this event. Here's what I know so far…"

https://www.google.com/search?q=samuel+l+jackson+avengers&tbm=isch&tbo=u&source=univ&sa=X&ved=0ahUKEwjXu4jwwMbZAhUX3WMKHQn6BFgQ7AkITw&biw=1280&bih=590&dpr=2.5#imgrc=PWE4iuZdGvb4QM:

Medical Event Reporting

Submit

Event Date	Patient Name	SSN (Last Four Only)
2/26/2018	Anna Fallax	

Location

9D

If the correct location is not in this list, please let us know in the **Description of the Event** and we will add it.

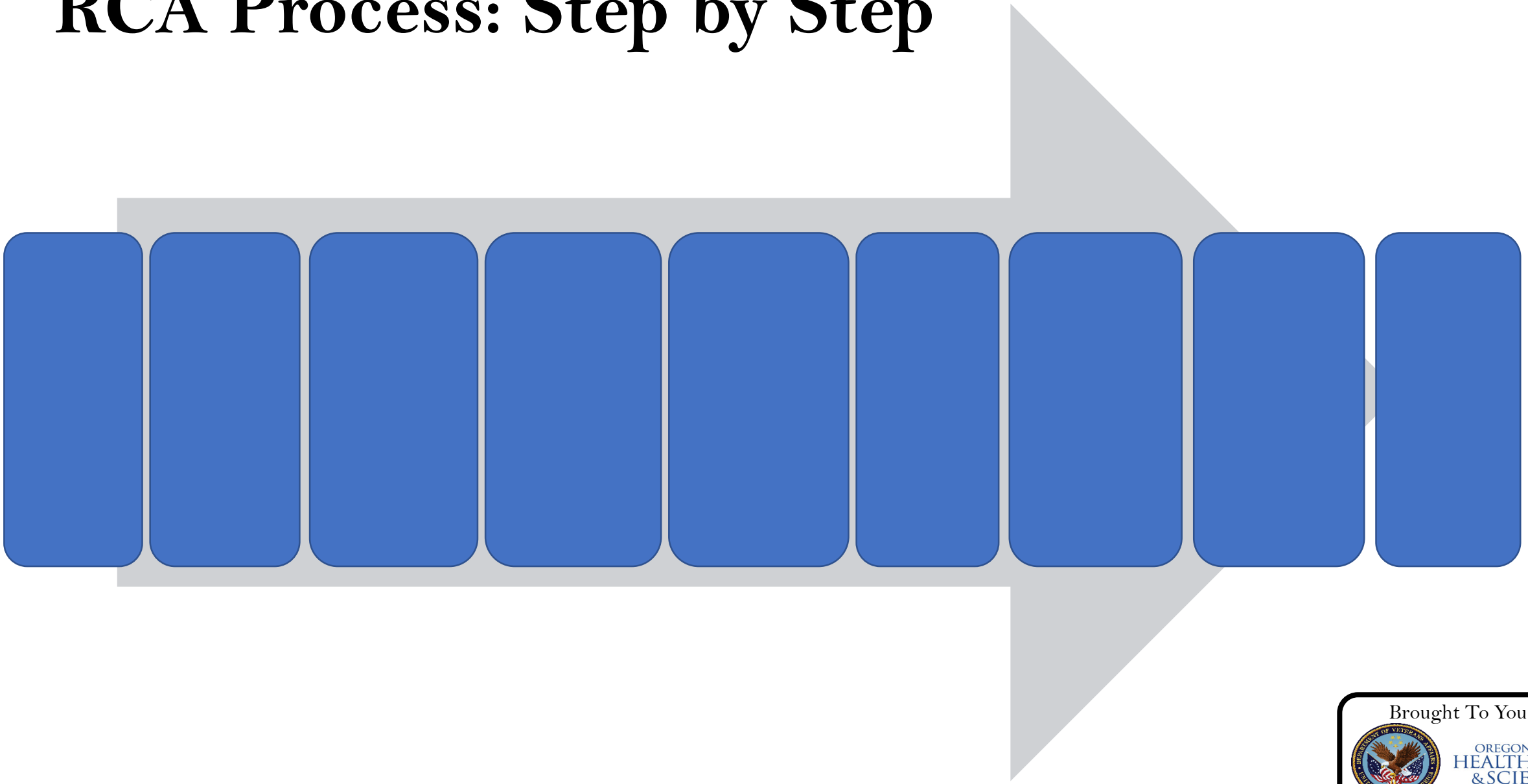
Patient Age	Patient Sex
18	Female

Description of the Event

Following ICU consult, a patient in the Emergency Department was given the incorrect route of administration for epinephrine to treat anaphylaxis. This lead to cardiac arrhythmia, seizure, and ICU admission.

Time of Event

RCA Process: Step by Step



1. Charter a Team

ED Representative

Patient safety leadership reviews the report and organizes representative

ICU Representative

Activity: Based on the medical event report below what teams members do you want to recruit for this RCA?

- **Pharmacy Representative**
- NOT individuals directly involved in the error

Patient Safety Officer

Here is a reminder of the medical event report →

Following ICU consult, a patient in the Emergency Department was given the incorrect route of administration for epinephrine to treat anaphylaxis. This lead to cardiac arrhythmia, seizure, and ICU admission.

https://www.google.com/search?q=the+avengers&source=lnms&tbm=isch&sa=X&ved=0ahUKEwjSp_zG28bZAhVixFQKHWdkBIwQ_AUICigB&biw=1280&bih=590#imgrc=ywiSyHhHtQmVjM:

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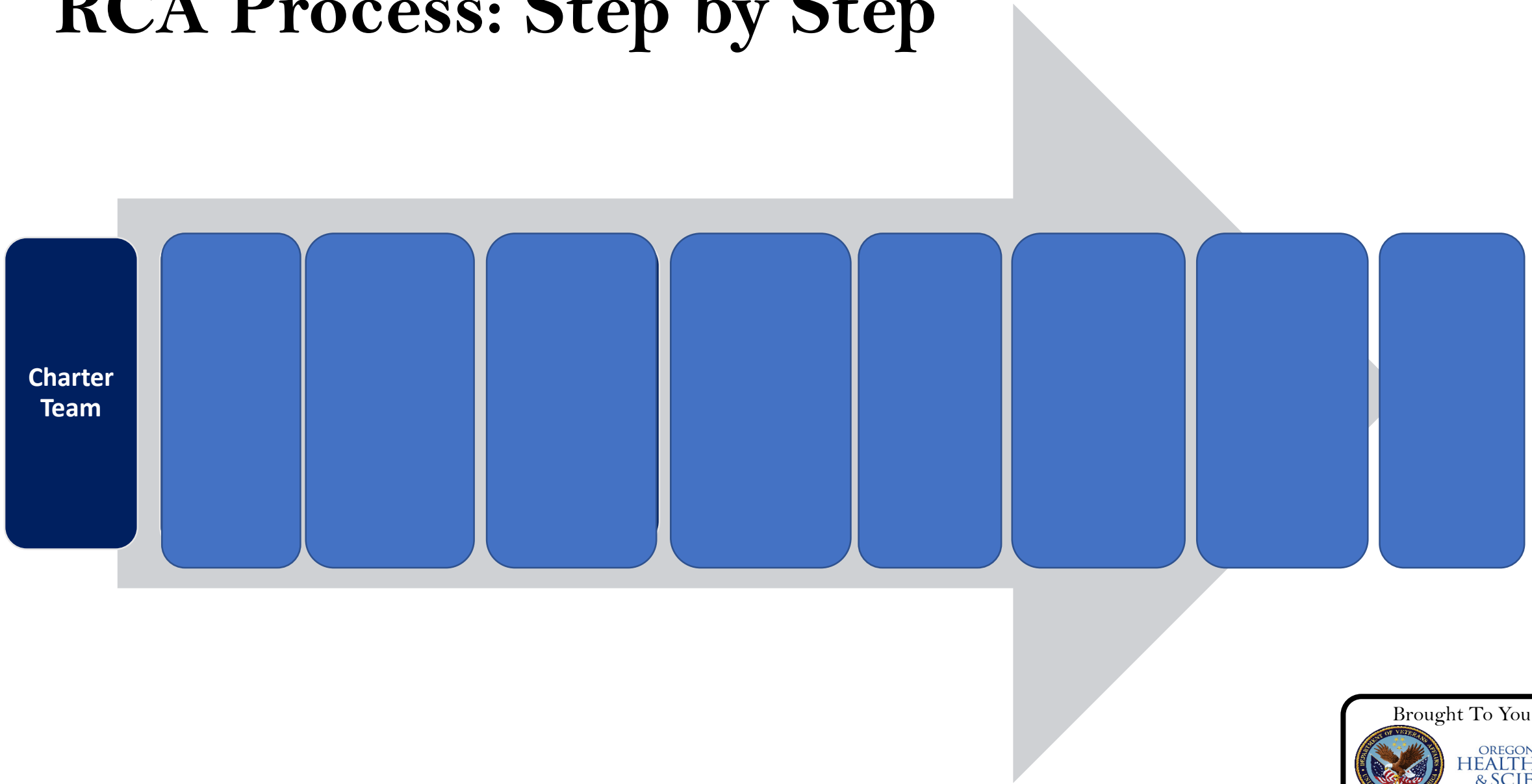
RCA Process: Step by Step



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2. Chart Review

Activity Part 1: Review the charts provided. Create a list as a group of the pertinent information you collected from chart review.

Activity Part 2: What information do you still want to know based on the chart review? Create a list as a group of questions you still want answered.

Here is a reminder of the medical event report →

Following ICU consult, a patient in the Emergency Department was given the incorrect route of administration for epinephrine to treat anaphylaxis. This lead to cardiac arrhythmia, seizure, and ICU admission.

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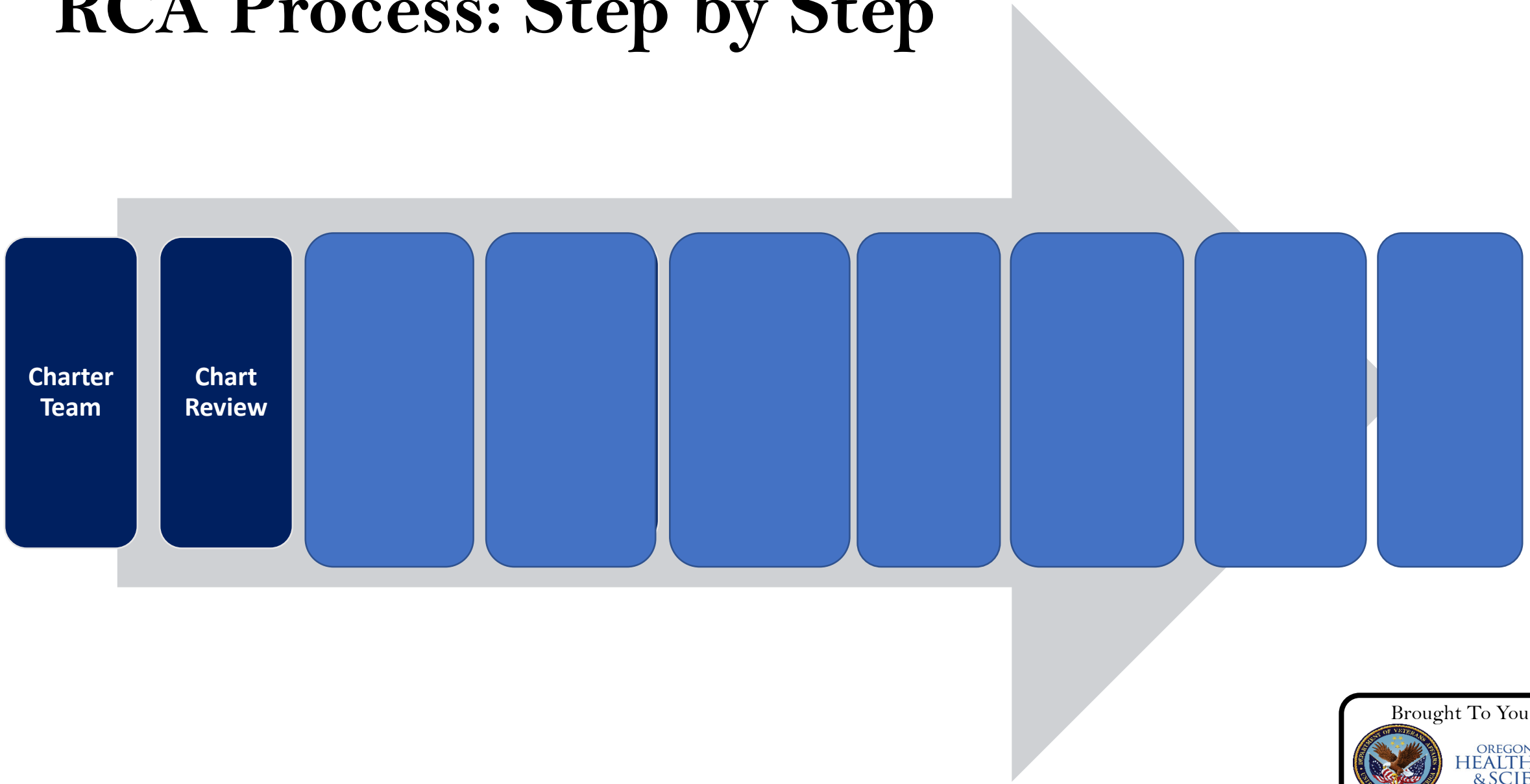
RCA Process: Step by Step



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3. Draft sequence of Events

Activity: As a group, create a sequence of events as you perceive them to have occurred.

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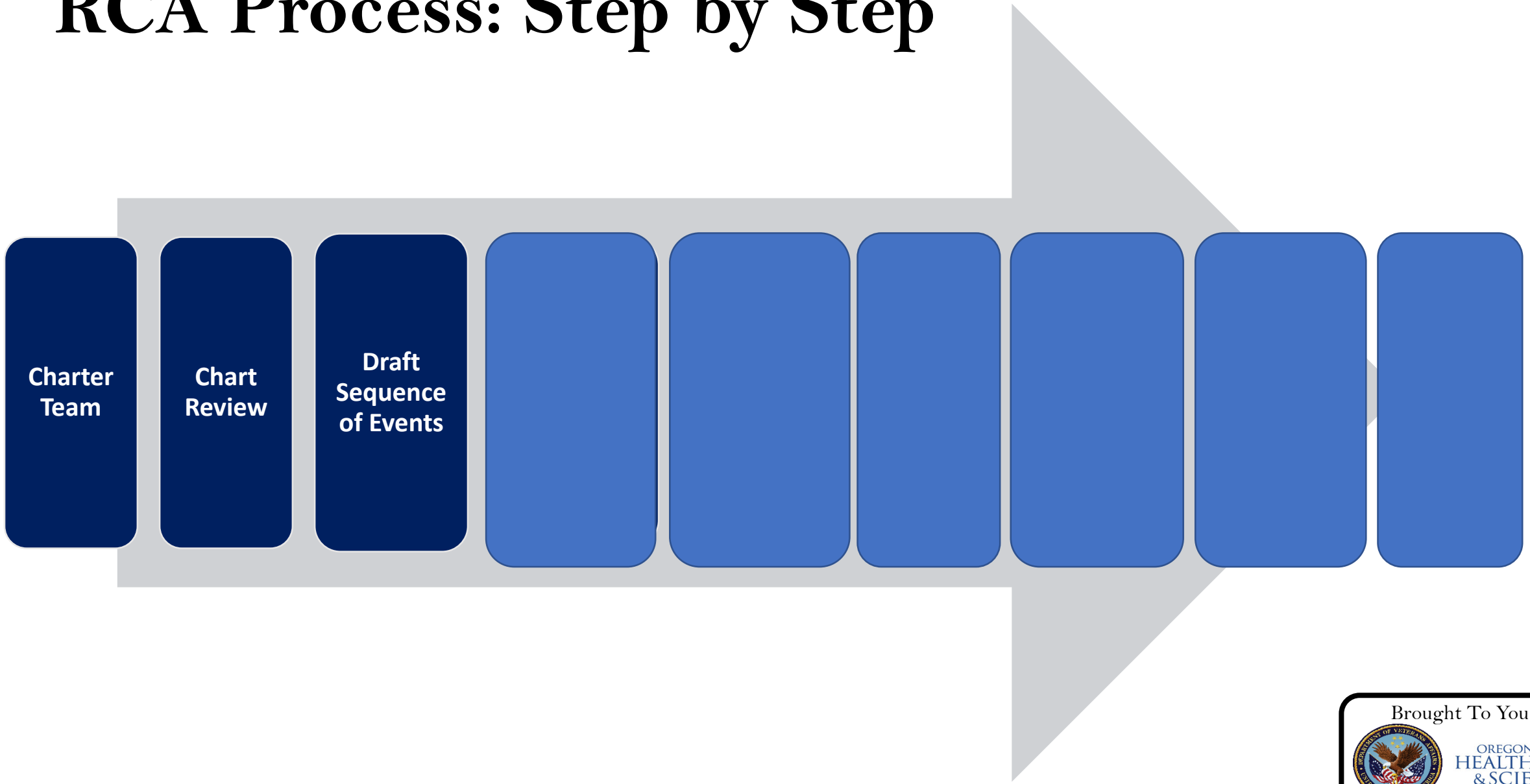
Draft sequence of Events

1. Patient presents with anaphylaxis
2. ED intern evaluates patient
3. ICU fellow recommends epinephrine
4. Emergency Department intern writes order for 0.3 mg epinephrine
5. ED Nurse administers 0.3mg epinephrine IV
6. Patient develops ventricular tachycardia and seizure requiring intubation and ICU transfer

RCA Process: Step by Step



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4. Fill in the Gaps: (Fact Finding)

Activity Part 1: Conduct a series of interviews of people involved in the event. Try to understand each person's perspective on the case. Ask questions to help you more fully understand what occurred and why.

Activity Part 2: As a group, review what you learned from the interviews to fill in any remaining gaps.

https://www.google.com/search?q=mind+the+gap&source=lnms&tbm=isch&sa=X&ved=0ahUKEwiB_5Co3MbZAhVCh1QKHYtaD3AQ_AUICigB&biw=1280&bih=590#imgrc=49r2esqtmYpHhM:

4. Fill in the Gaps: (Fact Finding)

Next is a series of slides to review while interviewing the Emergency Department Physician

https://www.google.com/search?q=mind+the+gap&source=lnms&tbm=isch&sa=X&ved=0ahUKEwiB_5Co3MbZAhVCh1QKHYtaD3AQ_AUICigB&biw=1280&bih=590#imgrc=49r2esqtmYpHhM:

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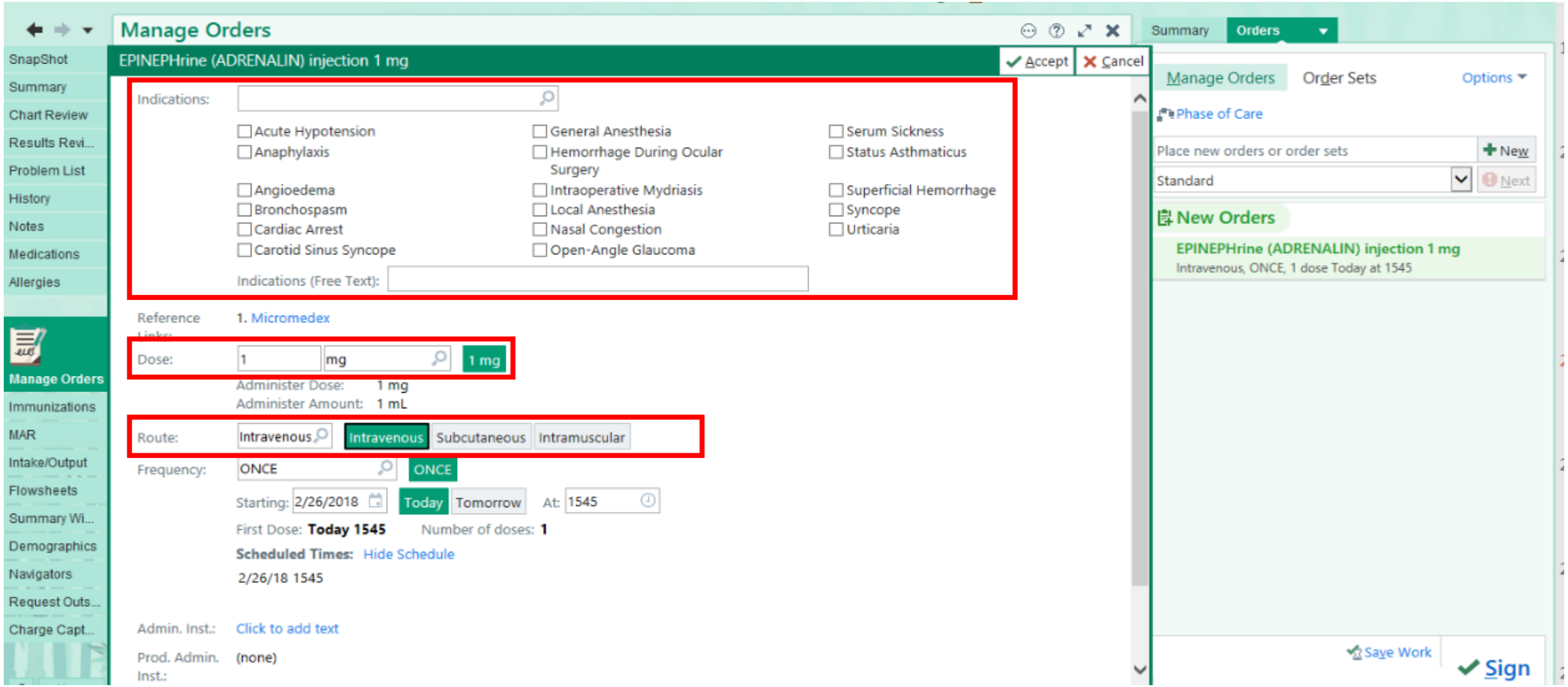

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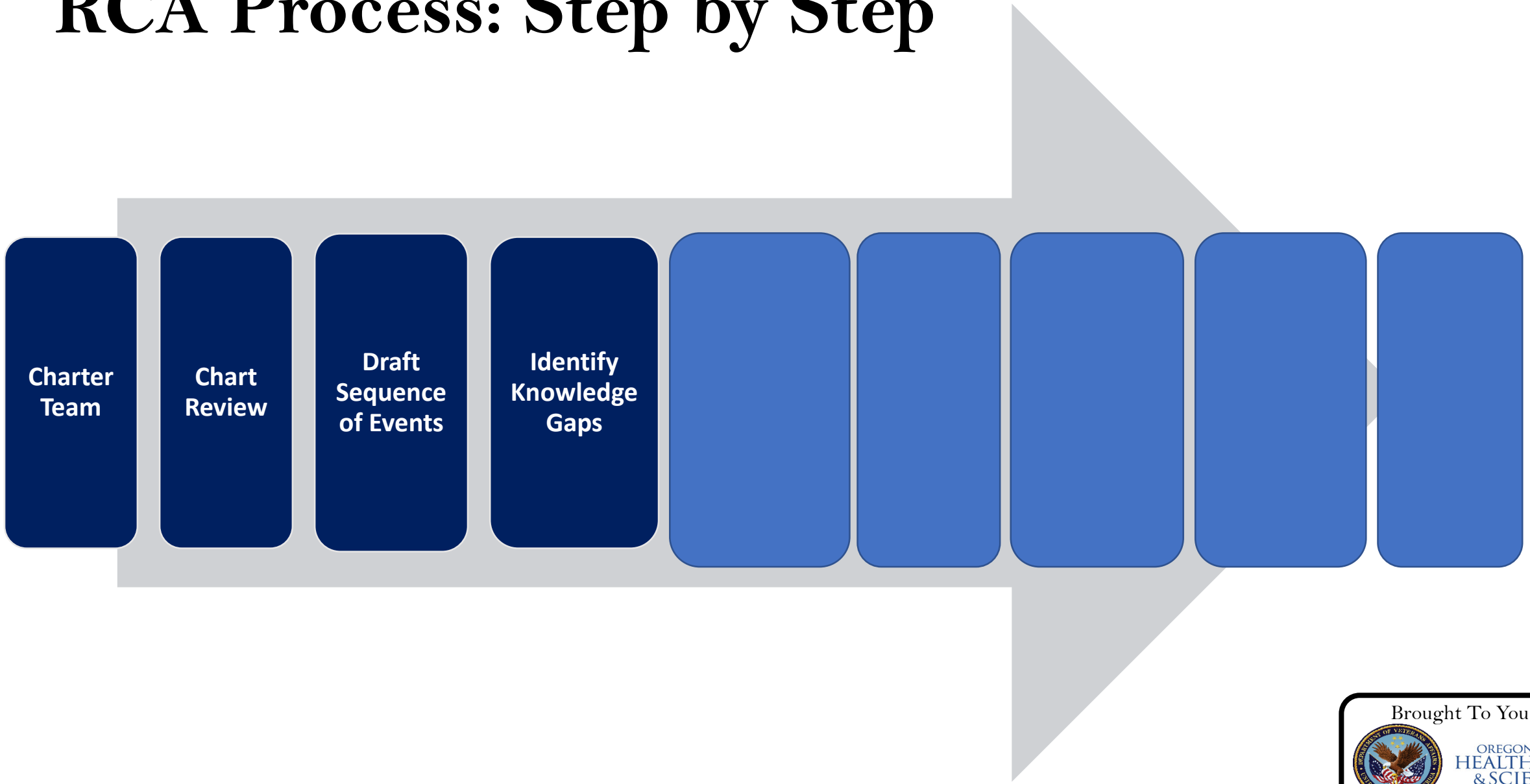
RCA Process: Step by Step



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5. Final Sequence of Events

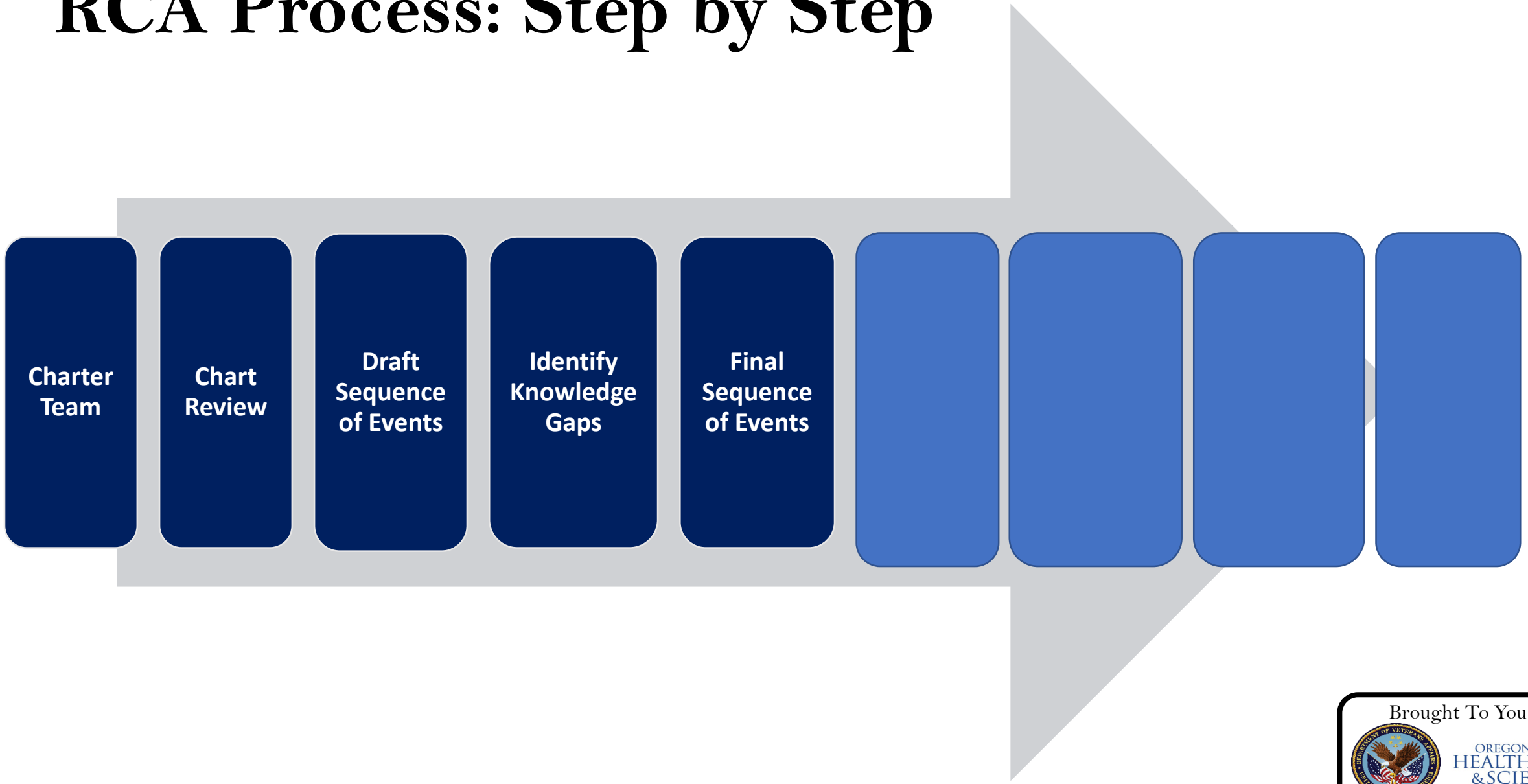
Activity: As a group, create a final sequence of events incorporating the information you have gathered from chart review and interviews.

https://www.google.com/search?q=final+countdown&source=lnms&tbm=isch&sa=X&ved=0ahUKEwjm7OTA3MbZAhWowlQKHR4dD98Q_AUICygC&biw=1280&bih=590#imgrc=8rjfDzwpLLA8LM:

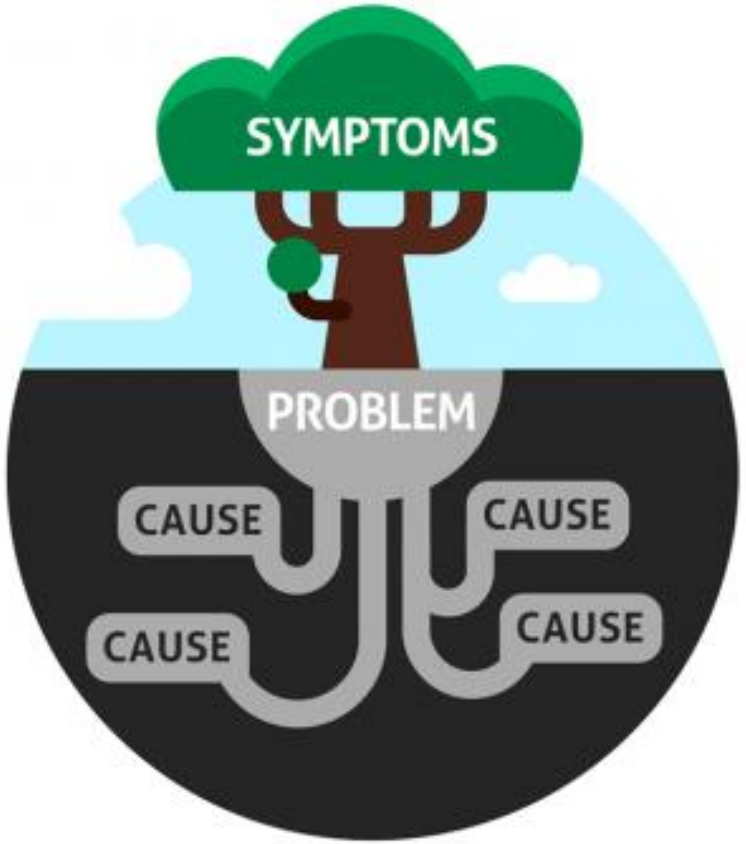
Final Sequence of Events

1. Patient presents with anaphylaxis
2. ED Intern evaluates patient
3. ICU fellow is curbsided for advice, recommends epinephrine 0.3mg dose but route not specified
4. ED intern orders epinephrine dose 0.3mg IV
5. Pharmacy approves intern order without noticing incorrect route
6. Nurse takes epinephrine from code cart instead of waiting for it to come up from pharmacy
7. ED nurse gives 0.3mg epinephrine as IV bolus
8. Patient develops ventricular tachycardia and seizure and is admitted to MICU

RCA Process: Step by Step



6. Identify Root Causes



Activity: Answer the following question in small groups or individually for the department you interviewed.

1. What was the main issue that went wrong?
2. Why did it go wrong?

Be ready to discuss with the larger group.

https://www.google.com/search?q=root+cause&source=lnms&tbm=isch&sa=X&ved=0ahUKEwjN0vDR3MbZAhVCsFQKHaQ1A6cQ_AUICigB&biw=1280&bih=590#imgrc=mUxlU6mhFwtDtM:

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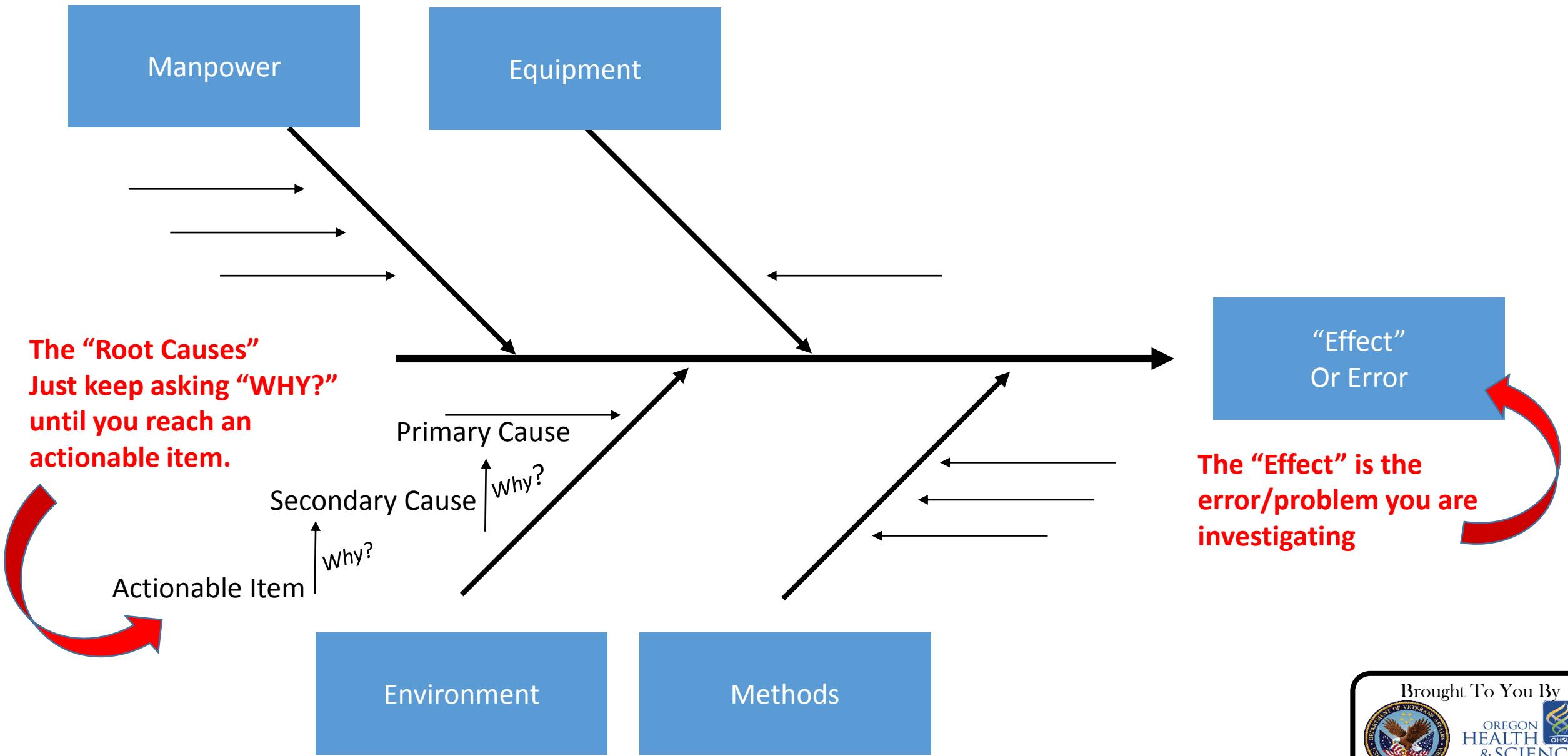
Cause & Effect Diagram (FISHBONE)



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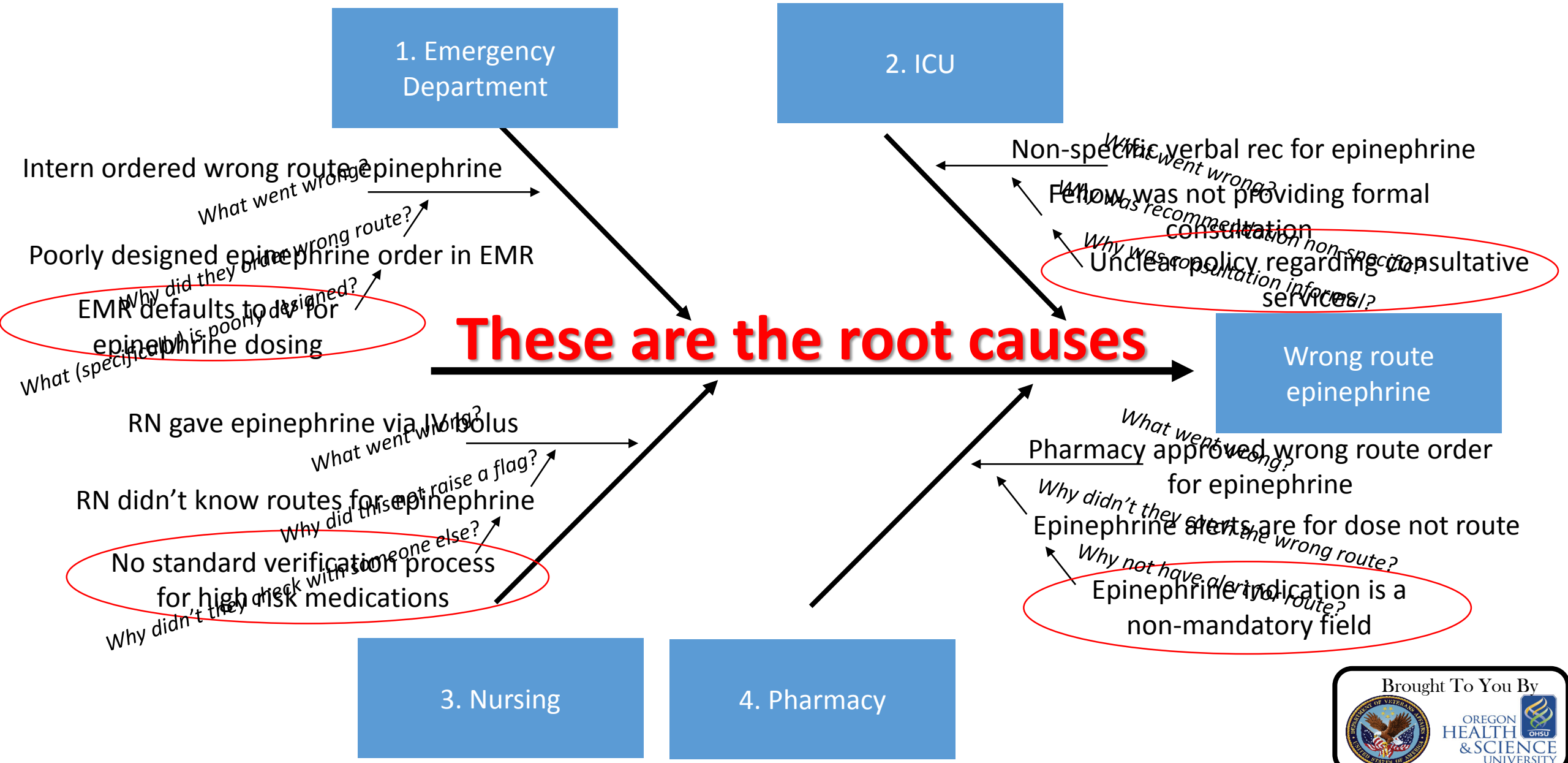
6. Identify Root Causes



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Congratulations

You just made a FISHBONE DIAGRAM

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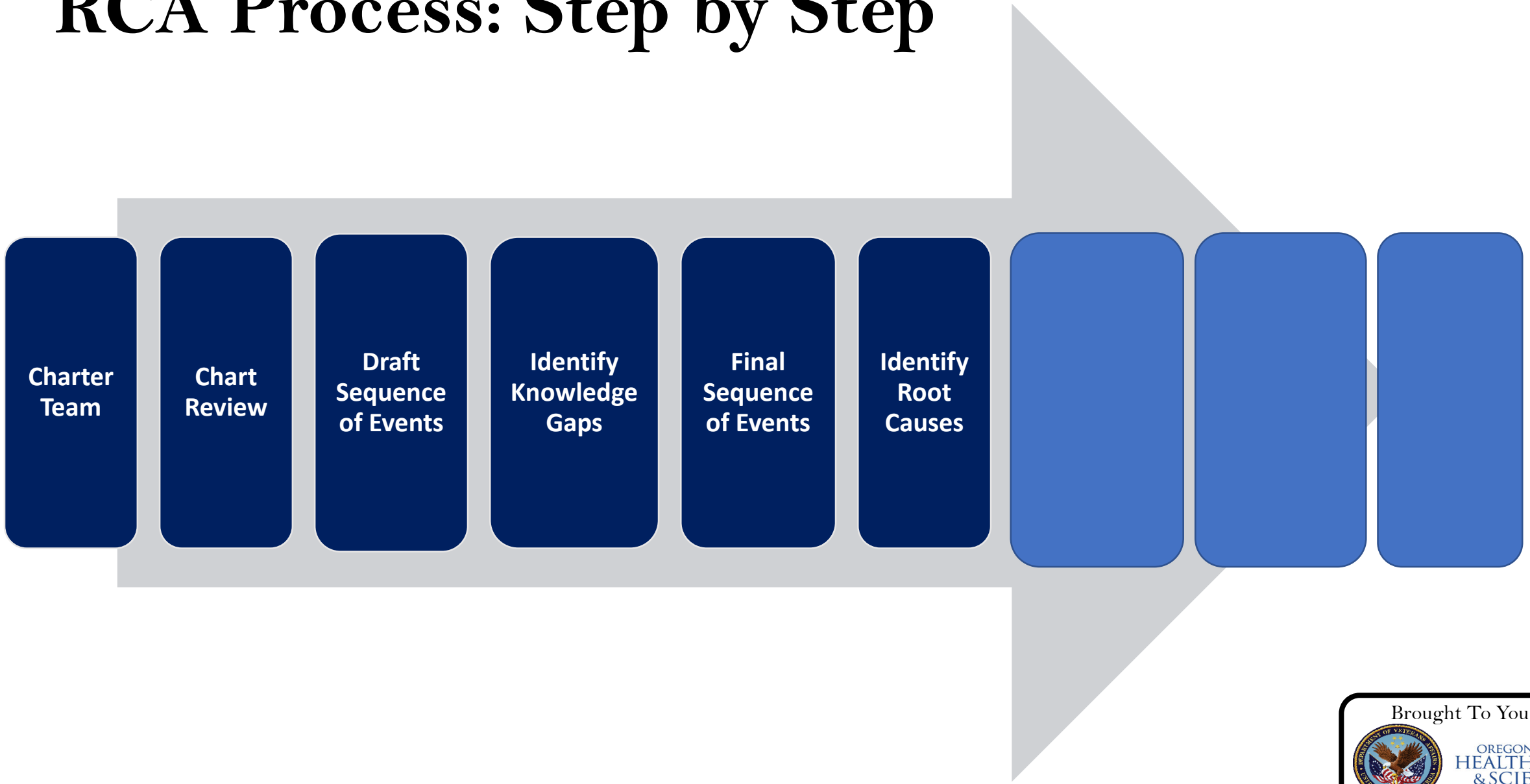
RCA Process: Step by Step



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7. Root Cause Statements

- Single sentence
- Always stated as:

  "Because x, y (error) occurred"

Activity: Create a root cause statement for each involved group

https://www.google.com/search?q=root+cause&source=lnms&tbm=isch&sa=X&ved=0ahUKEwjaga-q3cbZAhXGz1QKHb7mBSkQ_AUICigB&biw=1280&bih=590#imgrc=FFX0xVcLYujUcM:

7. Root Cause Statements

ED	Because the order for epinephrine defaults to IV in the EMR, the ED intern ordered the incorrect route of administration.	EMR defaults to IV for epinephrine dosing
ICU	Because there is not a clear policy regarding consultative services, the ICU fellow provided non-specific verbal advice that may have been misunderstood.	Unclear policy regarding consultative services
Nursing	Because there is no standard verification process for high-risk medications, the ED nurse did not catch the medication error.	No standard process for high risk medications
Pharmacy	Because indication is not a mandatory field in the EMR, there is no flag for route of epinephrine administration and the pharmacy approved a wrong route but correct dose medication.	Epinephrine indication is a non-mandatory field

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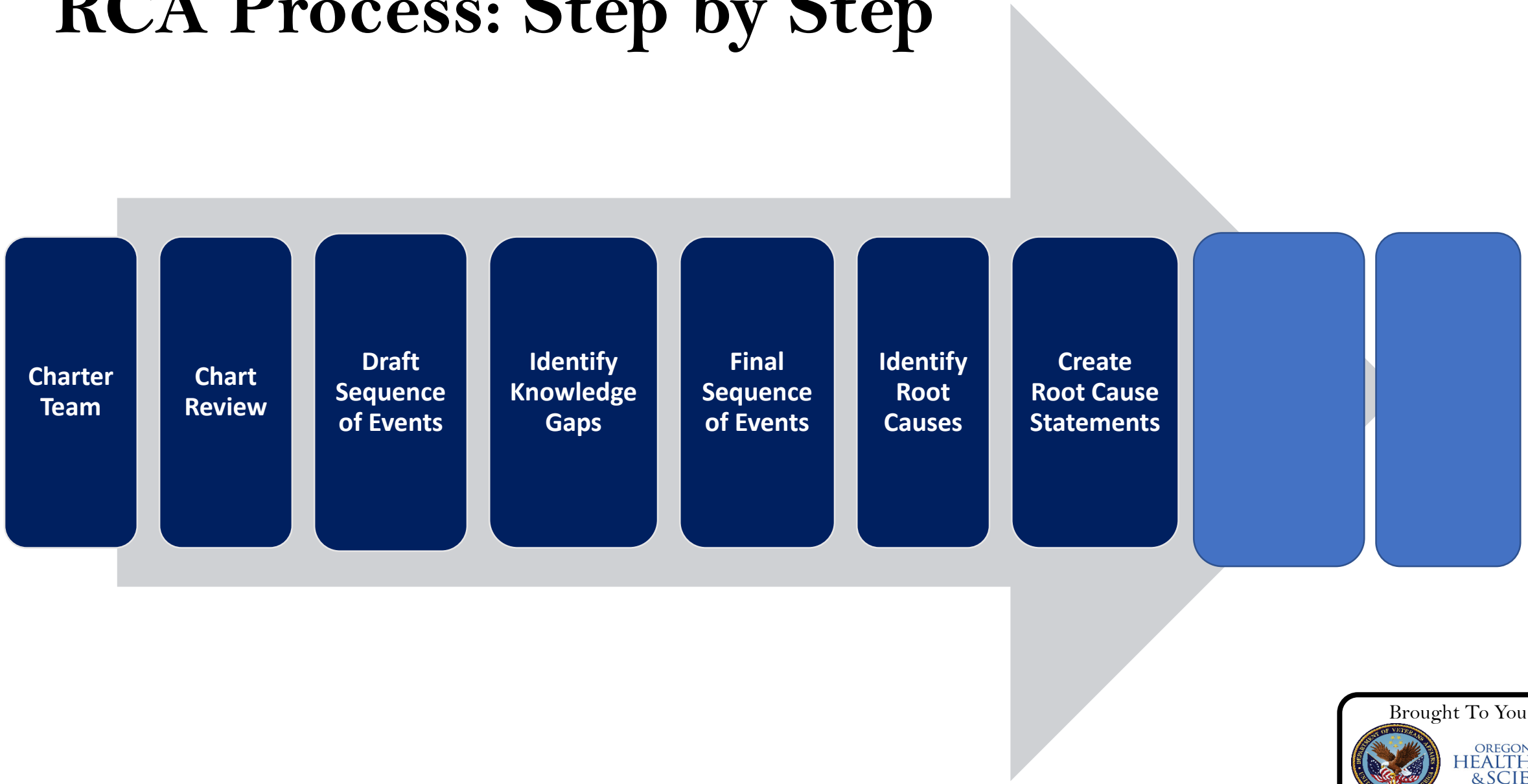
RCA Process: Step by Step



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8. Propose Corrective Actions

Generate a list of recommended actions for each root cause statement to prevent the error from reoccurring

Easier said than done?

8. Propose Corrective Actions

Two key principles to remember when deciding what corrective actions to take to prevent future error

1. Human error is inevitable

2. User-system interfaces can affect human behavior

Quick, hand me a heparin flush… Option A or B?

10,000 unit Systemic heparin anticoagulation

10 unit Hep-Lock

A

10,000 unit Systemic heparin anticoagulation

10 unit Hep-Lock

B

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8. Propose Corrective Actions

It's not about telling or forcing people to

work harder, smarter or with fewer errors…

It's about designing systems to

support the physical and cognitive work of clinicians.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4455947/pdf/nihms198627.pdf

8. Propose Corrective Actions

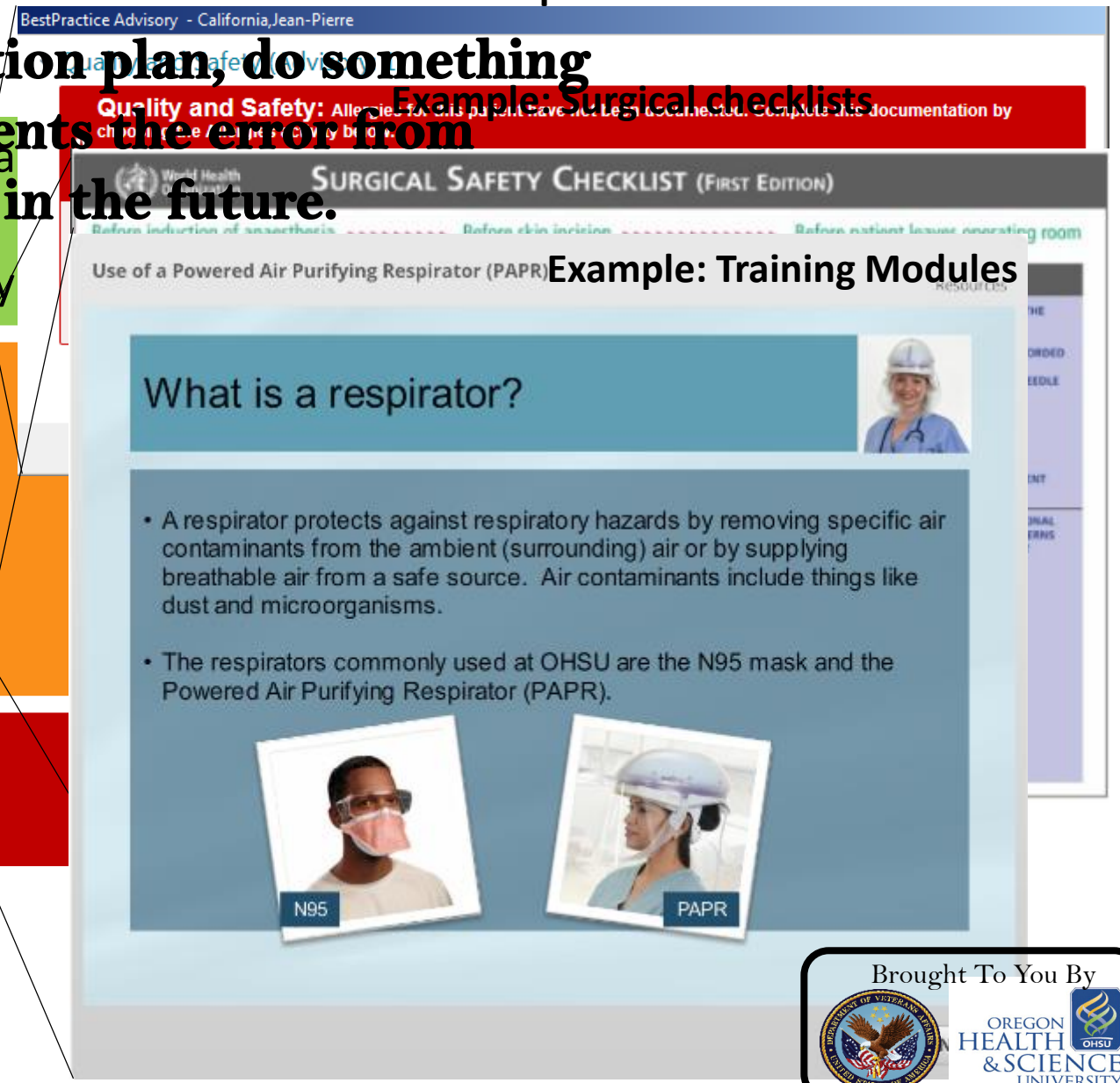
When choosing an action plan, do something that reliably prevents the error from reoccurring in the future.

Most Reliable
- Forced stop function (physical)
- Computerized/automated
- Human/machine redundancy

Somewhat Reliable
- Checklists
- Forced Pause
- Reminders
- Standardization
- Double checked

Less Reliable
- Education
- Rules/policy

Example: Alerts in the EMR



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8. Propose Corrective Actions

Activity:

- In groups come up with at least two system changes to prevent the root cause error that went wrong for your department.
- Come back together in groups to debrief.

Root Cause Statements

ED: Because the order for epinephrine is pre-selected as IV in the EMR, the ED intern accidentally ordered the incorrect route of administration.

ICU: Because the ICU fellow didn't use closed loop communication, non-specific verbal orders may have been misunderstood.

Nursing: Because there is no mandatory double-check for high-risk medications, the bedside nurse gave a wrong route medication.

Pharmacy: Because there are no flags for route of epinephrine administration, the pharmacy approved a wrong route but correct dose medication.

Examples of Corrective Actions

Most Reliable

- Forced stop function
- Computerized/automated
- Human/machine redundancy

Somewhat Reliable

- Checklists
- Forced Pause
- Reminders
- Standardization
- Double checked

Less Reliable

- Education
- Rules/policy

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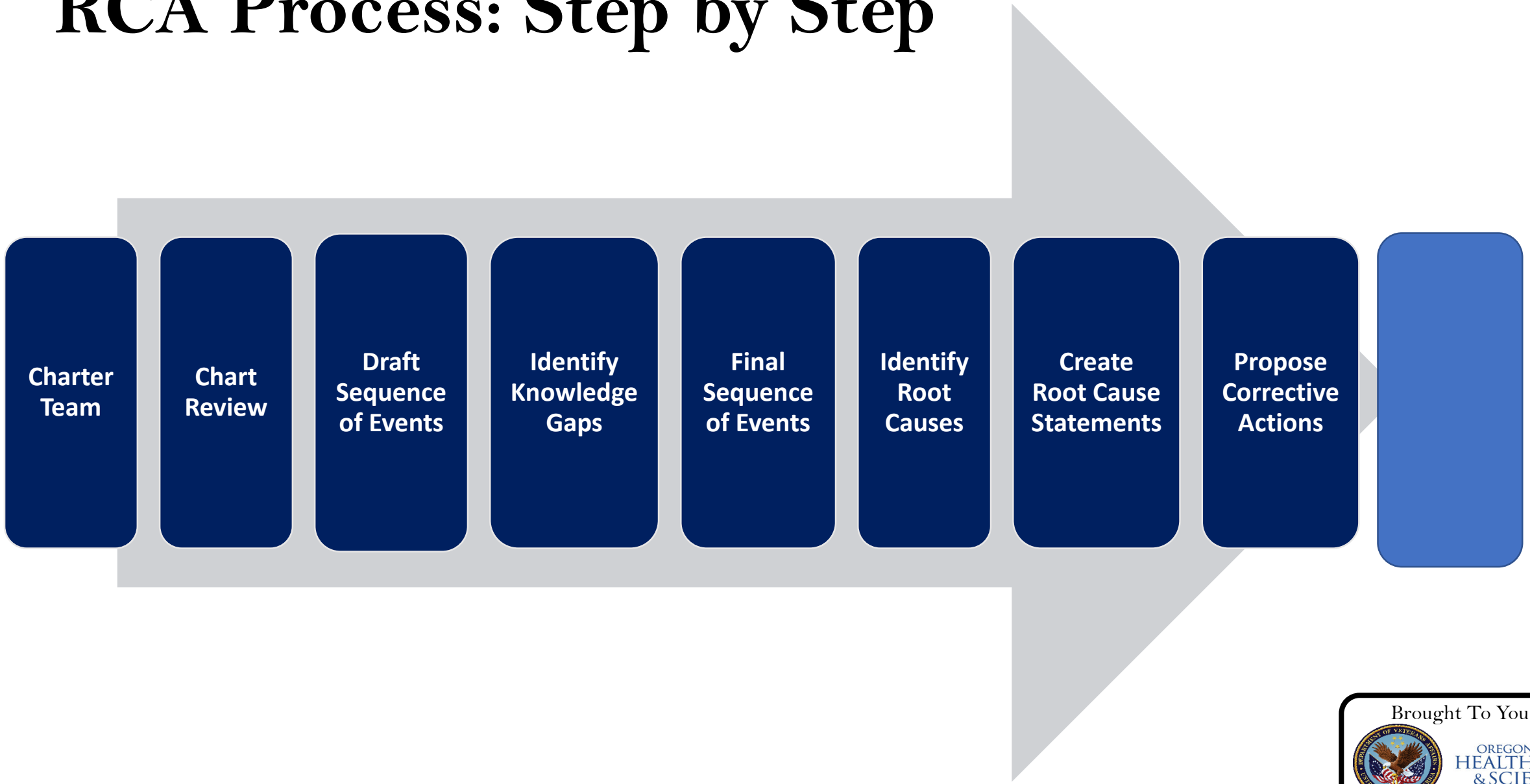
8. Propose Corrective Actions

Root Cause Statements	Corrective Actions
1. ED: Because the order for epinephrine defaults to IV in the EMR, the ED intern ordered the incorrect route of administration.	**ED:** Make indication for treatment (anaphylaxis vs code) a mandatory field, which then allows the EMR to automatically selects the correct route (IV vs IM).
2. ICU: Because there is not a clear policy regarding consultative services, the ICU fellow provided non-specific verbal advice that may have been misunderstood.	**ICU**: Eliminate curbside (informal) consultation, instead require all recommendations to be documented in a note.
3. Nursing: Because there is no standard verification process for high-risk medications, the ED nurse did not catch the medication error.	**Nursing:** Require two-RN verification for high-risk medications, including epinephrine for any non-code situation.
4. Pharmacy: Because indication is not a mandatory field in the EMR, there is no flag for route of epinephrine administration and the pharmacy approved a wrong route but correct dose medication.	**Pharmacy:** Because the EMR now requires indication as a mandatory field, EMR can now generate an alert for incorrect route and/or dose of epinephrine

RCA Process: Step by Step



9. Create an Action Plan

- Plan for who, how, and when the "fix" will take place.
- Make a timeline for monitoring completion.
- Monitor for "relapses" of the error.

Congratulations AGAIN!
You just completed an RCA!

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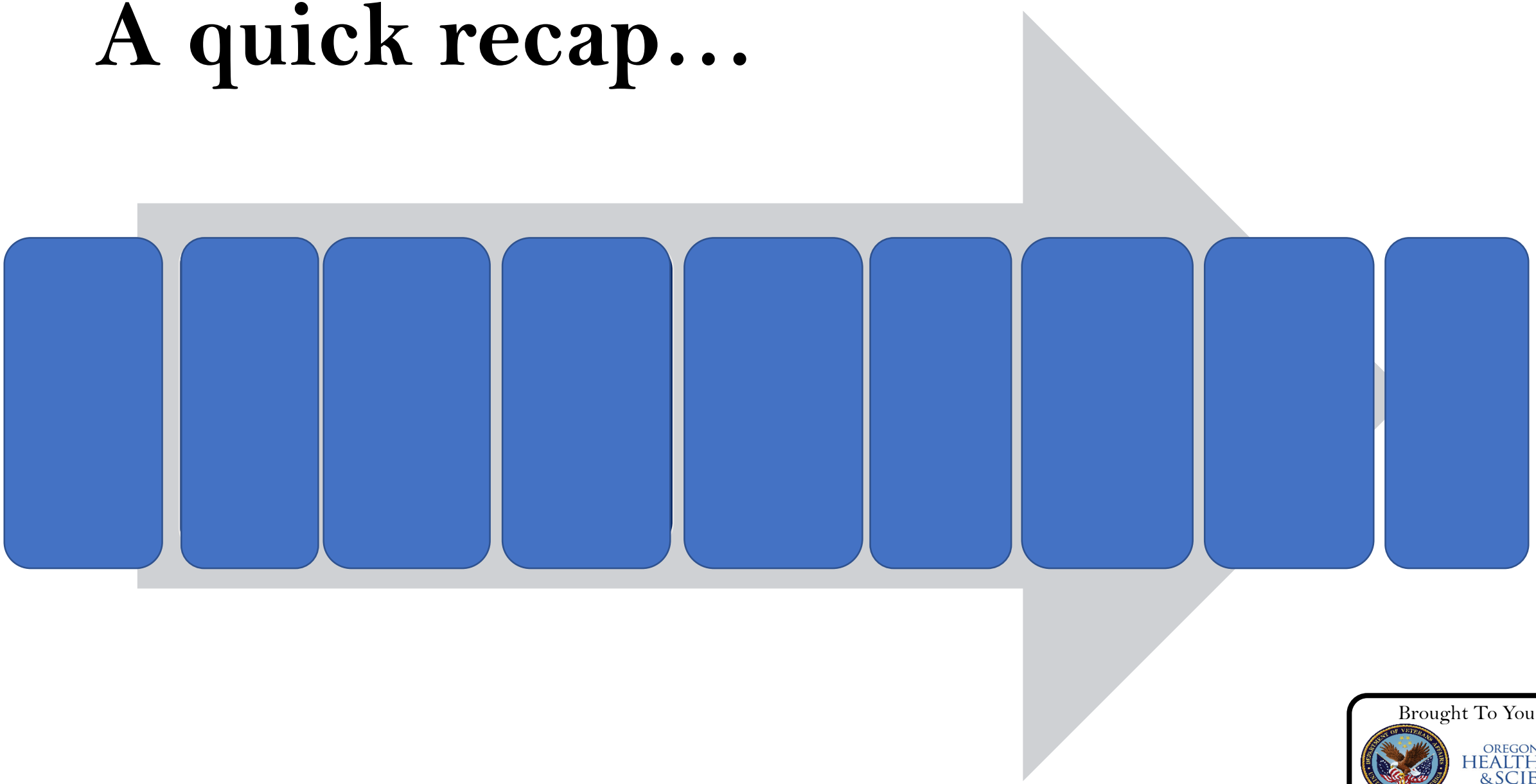
A quick recap…



SURVEY

You can either scan the QR code

or

Enter the link

bit.ly/ohsurca

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PIP Assignment

- PDSA Cycle #2: Clearly delineate:
  - Change concept you used
  - Plan
  - Do
  - Study
  - Act

- Please use graphic representations including pareto, run charts, histograms, etc to display your data for your presentation.

FEEDBACK

goo.gl/E5UfuY

(case sensitive)